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Programme Design for Climate Resilient Development: A Review of Key Functions

A REPORT SUBMITTED TO THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE AND THE UK DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

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Case Studies

Acronyms

AAS	African Academy of Sciences
ACIAR	Australian Centre for International Agricultural Research
ACPC	African Climate Policy Centre
AESA	Alliance to Accelerate Excellence in Science in Africa
AgMIP	Agricultural Model Inter-Comparison and Improvement Project
ASSAR	Adaptation at Scale in Semi-Arid Regions
BRACED	Building Resilience and Adaptation to Climate Extremes and Disasters
BRECcIA	Building Research Capacity for Sustainable Water and Food Security in sub-Saharan Africa
CARIAA	Collaborative Adaptation Research Initiative in Africa and Asia
CCKE	Coordination, Capacity Development and Knowledge Exchange
CCMCC	Conflict and Cooperation in the Management of Climate Change
CDKN	Climate and Development Knowledge Network
CIRCLE	Climate Impacts Research Capacity and Leadership Enhancement
CLARE	Climate and Resilience
CoCooN	Conflict and Cooperation over Natural Resources in Developing Countries
DECCMA	Deltas, Vulnerability & Climate Change: Migration & Adaptation
DFID	United Kingdom Department for International Development
ECR	Early Career Researcher
ESPA	Ecosystems Services for Poverty Alleviation
ESRC	Economic and Social Research Council
FCFA	Future Climate for Africa
FM	Fund Manager
GCRF	Global Challenges Research Fund
GLAM	Global Learning on Adaptive Management
GROW	Growing Research Capability to Meet the Challenges Faced by Developing Countries
HI-AWARE	Himalayan Adaptation, Water and Resilience
IDRC	International Development Research Centre
IPCC	Intergovernmental Panel on Climate Change
KB	Knowledge Brokering

KM	Knowledge Management
KMC	Knowledge Management and Communications
KPI	Key Performance Indicator
LDC	Least Developed Countries
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MOU	Memorandum of Understanding
NERC	Natural Environment Research Council
NRI	Natural Resources Institute of the University of Greenwich
NWO	Dutch Research Council (Nederlandse Organisatie voor Wetenschappelijk Onderzoek)
ODI	Overseas Development Institute
PI	Principal Investigator
PRISE	Pathways to Resilience in Semi-Arid Economies
PwC	PricewaterhouseCoopers
RMMRU	Refugee and Migratory Movements Research Unit
RQ+	Research Quality Plus
SHEAR	Science for Humanitarian Emergencies and Resilience
SRO	Senior Responsible Officer
SSN	South South North
TaSE	Towards a Sustainable Earth
TD	Transdisciplinary
ToC	Theory of Change
UKMO	United Kingdom Met Office
UPGRO	Unlocking the Potential of Groundwater for the Poor
USAID	United States Agency for International Development
WISER	Weather and Climate Information Services for Africa

Executive Summary

Over the past decade, development funders have committed considerable resources in support of large applied climate research programmes. These efforts have come a long way to strengthen the capacity of developing country researchers and decision makers in better understanding the current and future impacts of climate change and how best to respond to them. The United Kingdom's Department for International Development (DFID) and Canada's International Development Research Council (IDRC) have been at the forefront of this movement, and as a result, have amassed a considerable amount of know-how in setting-up, managing and evaluating applied climate research programmes.

As DFID and IDRC look to design the next generation of these programmes under the upcoming Climate and Resilience (CLARE) framework, it is crucial that CLARE builds on the experiences and lessons learned from prior initiatives. In supporting this effort, this report presents a series of insights and recommendations the design of CLARE. We draw on insights from eight past and current DFID-funded programmes, namely: Agriculture Model Intercomparison Project (AgMIP), Collaborative Adaptation Research in Africa and Asia (CARIAA), Conflict and Cooperation in the Management of Climate Change (CCMCC), Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE), Ecosystem Services for Poverty Alleviation (ESPA), Future Climate For Africa (FCFA), Science for Humanitarian Emergencies and Resilience (SHEAR), and Weather and Climate Information Services for Africa (WISER). We also reflect on a range of related initiatives on climate, resilience and development, as well as the experiences of the author team based on their active involvement in the design, management and delivery of many of these programmes.

In line with the Terms of Reference for this study, our analysis focuses on five function areas commonly found in programme-based research initiatives: research collaboration; knowledge management (KM); monitoring, evaluation and learning (MEL); research uptake; and adaptive management. Table 1 outlines key messages for each function area, as well as recommendations that apply across scales of implementation (from portfolio to programme to project) and phases of implementation (from start-up to implementation to consolidation).

Function area	High level recommendations	Recommendations by scale	Recommendations by phase
Research Collaboration: How do programmes encourage and support collaboration across institutions?	Ensure **dedicated strategic oversight, coordination of emerging insights, and flexible funding opportunities** to support collaboration for impact over portfolio and programme lifespans Use **proven mechanisms to support the development and maintenance of collaborative relationships**, and collaborative research. Sandpits, Action Labs, matchmaking workshops and catalyst grants provide exploratory spaces for building relationships and co-designing proposals. Working groups and face-to-face contact through the implementation phase can sustain these relationships. Contracting and funding arrangements have important implications for power hierarchies. **Equitable and respectful partnerships between Northern and Southern partners, and between research and impact support** partners is key.	**Portfolio:** Establish a portfolio-level coordination mechanism that has collaboration in its mandate. Examples could seek to mimic other portfolio-level structures such as the GRP Secretariat, or a scaled-up version of prior programme-level coordination mechanisms like CARIAA or FCFA's CCKE, **Program:** Set up programme-wide initiatives to foster and resource cross-project collaboration (such as working groups on geographical, thematic and programme function basis; conferences; flexible funding for emerging opportunities) **Project:** Ensure call documentation specifies programme- and portfolio-level coordination mechanisms into which projects will feed (and thus must plan and budget)	**Start-up phase:** Establish a portfolio-level coordination mechanism; support mechanisms to develop collaborative relationships; encourage rapid proposals from established networks that build on successful past collaborations **Implementation phase:** Multi-track approach: launch concept note calls to target recipients of catalyst/starter grants and open calls for proposals from established networks. **Consolidation phase:** Recognise the need to scale up resources for collaboration towards the end of the programme life-cycle (preferably through dedicated but flexible funds); consider dedicated synthesis and impact projects
Knowledge Management: How can programmes ensure that data and evidence emerging from research is documented and accessible within timeframes that allow it to be integrated into programme activities?	**Focus on people, not just products or systems**. While face-to-face contact may not always be possible, effective curation, signposting and editorializing of Knowledge Managament and Brokerage (KM/KB)content can help to promote a sense of connection and coherence across the portfolio. Take advantage of the CLARE lifespan to **gradually develop and tailor KM/KB functions alongside the programme membership** rather than aiming for a fully-fledged system from the outset.	**Portfolio:** Emphasize data access and archiving policies/visions (e.g. document storage). Establish a forum for high-order synthesis of emerging results. Consider specialized competencies needed for this scale of analysis (systematic reviews, etc.) **Program:** Establish joint enterprise, mutual engagement, shared repertoire of tools within programmes. Allocate flexible finance for responsive KM/KB activities. **Project:** Identify champions to provide project-level leadership (beyond positional leaders) &	**Start-up:** Build relationships between KM/KB focal points, governance representatives, support teams, and others who will be contributing to these processes, regardless of the model adopted **Implementation:** Establishing and maintaining 'housekeeping' practices to deal with growing repository **Consolidation:** Synthesize higher-order (programme/portfolio-scale) findings. Establish programme legacy through open-access data and document archiving,

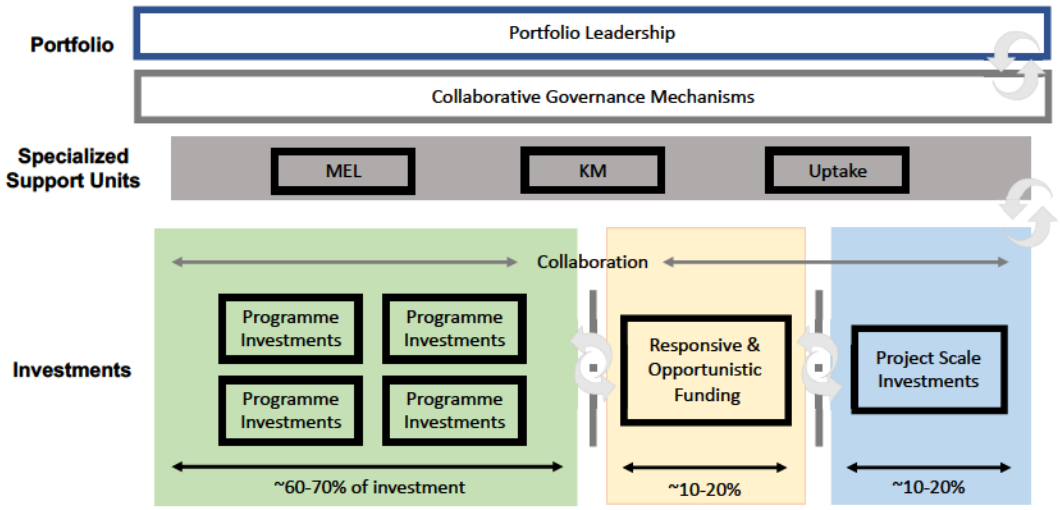
	Ensure there is **clarity on lines of accountability**. KM/KB systems perceived to be extractive exercises solely serving the funders are viewed with suspicion or even disdain.	promote collective buy-in to processes and products.	network migration, infrastructure handover, etc.
Monitoring, Evaluation and Learning: How can programmes track, assess, and learn from their performance at different scales in ways that can inform current and future practice?	**Take care in deciding where MEL functions reside**. Options to embed MEL functions within a stand-alone Knowledge Management unit, house it together with the Fund Manager, or keep MEL separate and external to both have considerable implications for the reliability and usefulness of MEL data. **Track only what is useful and feasible.** Quantitative indicators have an important role, but need to be directly helpful to projects and programmes and easy to collect. In many cases, it may be better to focus on capturing detailed qualitative stories of impact (rather than quantitative proxies). Projects can also benefit from the provision of dedicated MEL training and support (ideally from the KM function area). **Allow M&E to evolve.** Theories of change and impact pathways can help guide MEL frameworks more adaptively than rigid project logframes.	**Portfolio:** Focus should be on gauging the health and progress of higher-level objectives across CLARE programmes. Prioritise simple quantitative measures that are easy to track and non-time intensive on projects **Program:** Focus on monitoring progress of projects and identifying capacity gaps that require additional support or course-correction. Set up dedicated programme-level MEL manager (ideally one for each program). **Project:** Focus on reporting and gathering stories of impact. Where clear outcome levels targets have been specified, consider implementing a select number of robust impact evaluation. Strong support from the MEL manager is needed.	**Start-up:** Focus on specifying the theory of change (ToC) and Impact Pathway. Consider retrospectively collecting information on recently terminated DFID programmes and supporting tailored political economy analyses **Implementation:** Focus on consolidating the ToC and Impact Pathway, as well as the indicators used to track progress. Start to collect qualitative stories of change to feed into impact pathways **Consolidation:** Focus on evaluating progress towards ToC and Impact Pathway. Consider follow-up assessments at the portfolio level (focused on capturing the legacy of projects/programmes)
Research Uptake: How do programmes scale research results beyond study sites and pilots to impact policy and practice in different places and at different scales?	Consider experimental modalities such as **embedding and secondment approaches** that bring together unlikely partnerships. **Funders have a role** in communicating the importance of uptake and advocating and enabling uptake throughout the project. Programmes and projects should **conduct reflexive exercises** that identity strengths and gaps, and build capacity through the unallocated budget lines that anticipate these needs.	**Portfolio:** Ensure the building blocks to enable uptake are in place. Conduct regular horizon scans for new opportunities **Program:** Set up flexible or responsive uptake funds to support unplanned or emergent opportunities. Conduct stakeholder mapping and support with on-going stakeholder engagement throughout the entire programme cycle	**Start-up:** Focus on planning for uptake while building the foundation of trust and fostering relationships. Ensure there is clarity among all participants about what uptake means and how it will be pursued. **Implementation:** Focus on engagement, co-production, network and trust building. **Consolidation:** There should be limited new research in the last 1-2 years. Have a

		Project: On-going engagement with sub-national and local actors to build trust, broaden networks and seek opportunities to engage in co-production. This can be supported by stakeholder mapping exercises.	dedicated period for synthesis, communication, promotion and engagement. Set aside additional resources for these activities (e.g. cross-portfolio syntheses; opportunities grants)
Adaptive Management: How do programmes react to internal or external changes in their environment, and respond to unexpected or emergent opportunities?	**Close coordination and interactions** should exist between programme and portfolio-level functions. This includes close working relationships and regular check-in periods, as well as secondments of staff between the portfolio and programme levels. Promote the view that **project logframes are live documents**, particularly in the first two years. They should be regularly reviewed, and revised as needed. This means making good use of the annual-review process. **Adaptive management looks different in fragile and conflict-affected states.** This could mean setting up of dedicated protocols for rapid programme and portfolio-level decision-making and arbitration when on-the-ground tensions threaten the delivery or safety of projects.	**Portfolio:** Focus on ensuring that programmes are responsive to changing environments or needs. Ensure quick turn-around and approval/rejection for change requests **Program:** Focus on supporting environments for meaningful reflection amongst and across the projects. Provide technical support in allowing projects to redesign elements, as well access available sources of finance. Commission (or carry out) periodic assessments of knowledge gaps **Project:** Focus on continually reflecting on the project's ToC and impact pathways, bringing together project partners and checking-in with MEL teams to assess whether changes need to be made to accommodate new circumstances	**Start-up:** Host regular check-ins with the MEL manager to gauge progress (light touch). Emphasis on quarterly and annual reviews to reflect and revise logframes/ToCs **Implementation:** Revert to annual reviews for check-ins with MEL manager on progress. Ensure a strong emphasis on the mid-term review, encouraging an in-person full team check-in **Consolidation:** Fewer opportunities to change project structure. Ensure projects and programmes are able to respond to new policy windows of opportunity, through funding resources as well as technical support

Having set out a series of recommendations for each function area above, we now consider how these can be brought together through two design options and principles for CLARE. In both cases we assume that a majority of CLARE research investments will be disbursed via multi-project programmes selected via competitive calls. There are also likely to be separate reposive investments emerging from ongoing work and policy windows. Finally, we envisage a small tranch of finance set aside for stand-alone projects that might be more speculative, experimental, or time-bound. What is critical, based on our investigation, is to ensure there are avenues for interaction and exchange between these different funding streams, and that functional areas do not overlook smaller scales of investment, where significant innovations might be emerging.

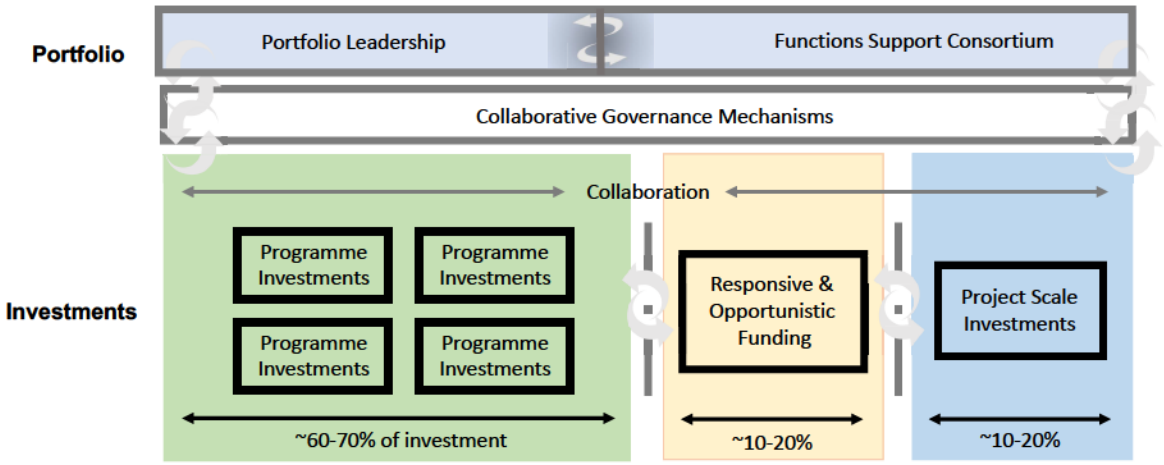
Under our first scenario (Option 1) we see portfolio and programme leadership being supported by specialized partners that provide dedicated support and brokering for the function areas at the portfolio level (e.g. one institution leads on MEL, another KM). These actors would all be members of collaborative governance mechanisms alongside representatives from the portfolio and programme levels.

Option 1 - Specialized Support Units



Option 2 presents a slightly different structure, whereby the specialized support actors from Option 1 constitute a consortium that works alongside the portfolio leadership, as opposed to acting as individual specialized units. This approach acknowledges the interlinked nature of the five function areas.

Option 2 - Consortium of Functions Support



An advantage of Option 1 is that it facilitates the use of a life-cycle approach to portfolio support, bringing some support activities online, or winding them down at specific times of the life-cycle. In so doing, however, it may be less interconnected. Option 2 offers a more cohesive support unit, enabling cross-cutting planning and system development, and building trust between support consortium members over the longer-term. However, this Option may reduce the ability to phase support units in and out. Importantly, both options provide a mechanism for cross-scale participation in the governance of the function areas as well as degrees of independence for evaluative functions. Both options also recognize that the portfolio leadership cannot fully manage all the function areas given the expected size of CLARE.

Alongside the five function area analyses, we also highlight a range of cross-cutting recommendations that should be considered as part of the design of CLARE. These are:

i. **Adopt a portfolio approach to CLARE investment:** Seeing CLARE as a portfolio of investments that can feature varying scales, timelines, configurations, and risk-profiles represents an opportunity to be seized. This can allow some investments to accept higher levels of risk and uncertainty (for example, working in conflict affected states, frontier areas of research, or with relatively untested partners) while opting for more secure investments into established partners and themes elsewhere.

ii. **Ensure that CLARE is guided by a portfolio-level Theory of Change:** CLARE is likely to fund a large and diverse range of research activities. This may create challenges in defining how and why programmes and projects should work towards a common purpose. A portfolio theory of change should set out how the five function areas contribute to CLARE's impact pathways (for example, mobilizing evidence, strengthening capacity or enabling knowledge co-production), and how programmes and projects are expected to contribute to them. It will be an important resource for explaining the "why" of these functions in large and highly-distributed collaborations.

iii. **Adopt a life-cycle approach to portfolio and programme design:** CLARE presents an opportunity to take a more systematic and developmental approach to the portfolio, orienting investments and support systems according to the stage of portfolio development. With programmes and projects operating on different timelines than the portfolio itself, life-cycles within CLARE will not always neatly overlap, but as a design principle, this can help orient the activities of function areas, programme management, and other support functions.

iv. **Invest in new and established relationships:** Strong, trusting relationships at and between all scales of CLARE will be critical to its cumulative impact. Among the trade-offs in investment choices is supporting pre-existing research partnerships that can start quickly and work together with confidence versus promoting new partnerships that grow and strengthening the community of climate researchers in the South. CLARE has the opportunity to do both, but should ensure systems are in place to support new collaborators or partnerships.

v. **Ensure distributed leadership and governance of function areas:** Lessons from this review show that distributed membership in the leadership and governance of function areas is an effective means of sustaining engagement. At the portfolio level, leadership and governance group membership can draw from project and programme teams, facilitating knowledge exchange and innovation across scales.

vi. **Invest in organizational capacities in function areas at start-up phase:** CLARE should allocate funds to help organizations meet the minimum standards needed for collaboration, in terms of: in-house human resource capacities; IT services and connectivity; access to paywalled resources; leadership; monitoring and financial reporting, etc. Pay particular attention to fragile and conflict-affected settings where persistent uncertainty requires that contexts be assessed continually, and appropriate capacity support be provided.

vii. **Prioritise more than research outputs/outcome:** CLARE should move away from traditional models of research excellence dominated by numbers and impact factors of peer reviewed publications, towards newer and arguably more relevant models of excellence that encompass a wider range of concerns of the global South including integrity, legitimacy, importance, and positioning for use.

viii. **Establish cross-scale systems to strengthen coordination:** CLARE should ensure that a certain number of ‘soft’ and ‘hard’ systems are developed to work across portfolio to project scales. Obvious candidate systems to start with include a linked knowledge management system; common reporting templates; and a shared set of meetings, events or opportunities (such as innovation funds) that can incentivise and enable collaboration across the portfolio.

ix. **Develop a legacy strategy from inception:** An advantage of CLARE's portfolio design is that it can serve as a legacy vehicle for shorter-term or early-stage projects and programmes, provided systems are in place to enable it. Systems may range from an open-access database for data and research outputs (particularly outputs other than peer-reviewed journals which are often poorly indexed online) to 'alumni relations' to ensure that outgoing researchers and collaborators remain connected to CLARE's activities and progress

In synthesising these findings, recommendation and scenarios we hope that experiences from past applied climate research programmes can help to inform CLARE's design and delivery. As a portfolio of programmes, CLARE represents a unique opportunity where effective planning can overcome some of the challenges of multiple independent programmes. In setting the standard for the next generation of applied climate research programmes it can showcase best practices in the delivery of world-leading climate research that guides key decisions and policies for development impact.

1. Introduction

Climate change represents one of the grand challenges of our time in terms of the scale of the impact it will have, its complexity, and the need for global cooperation to develop lasting solutions (Reid et al, 2010). As highlighted by the recent IPCC special report on global warming of 1.5°C, the stakes are high and time available to act is short (Allen et al, 2018). Global public investment into research and action on climate change has risen in response to these concerns, with ca. $141 billion USD of public climate finance invested in 2016 alone (Buchner et al, 2017). However, effective responses are not just a question of resources, they are also about designing research, policy and collective actions that address the complex and multi-dimensional nature of the climate challenge in order to have meaningful impact.

As global investments flow into ever-larger and more complex programmes to address on climate and resilience, researchers and practitioners are being called upon to not only drive forward our understanding of the challenges, but also to ensure that new knowledge is put to use in helping countries, communities, and households anticipate and adapt to a changing climate. Making this happen means adopting new approaches to designing, supporting, and implementing research (Schneider et al, 2019; Jones et al, 2018; Freeth and Caniglia, 2019).

The United Kingdom's Department for International Development (DFID) and Canada's International Development Research Centre (IDRC) have been at the forefront of recent investment into collaborative research at the nexus of climate and development challenges. These investments have tended to focus on use-inspired, applied research aimed at addressing key development priorities, identified in consultation with stakeholders in the Global South. Over the last decade, significant learning and progress has been made in funding and developing transdisciplinary and collaborative research programmes. This learning is evidenced through the evolving approaches to these programmes, even observable between earlier and later programmes in the sample of eight reviewed here. More specifically, later programmes tend to feature a stronger commitment to: collaboration and transdisciplinarity, use-oriented or impact-oriented research; demand-informed or demand-led research; building capacity in the Global South; an openness to innovation and experimentation; and, as the commissioning of this report demonstrates, an interest in learning from past experiences.

As IDRC and DFID reflect on the design of their forthcoming Climate and Resilience research portfolio (CLARE), there remains much to be learned from these investments, which represented a first generation of programmes with this strong collaborative and use-inspired focus (Jones et al, 2018; Harvey et al, 2019). This report takes up this task, looking at how particular dimensions of Programme design and support structures contributed to research outcomes and impacts.

2. Background, Assumptions and Study Design

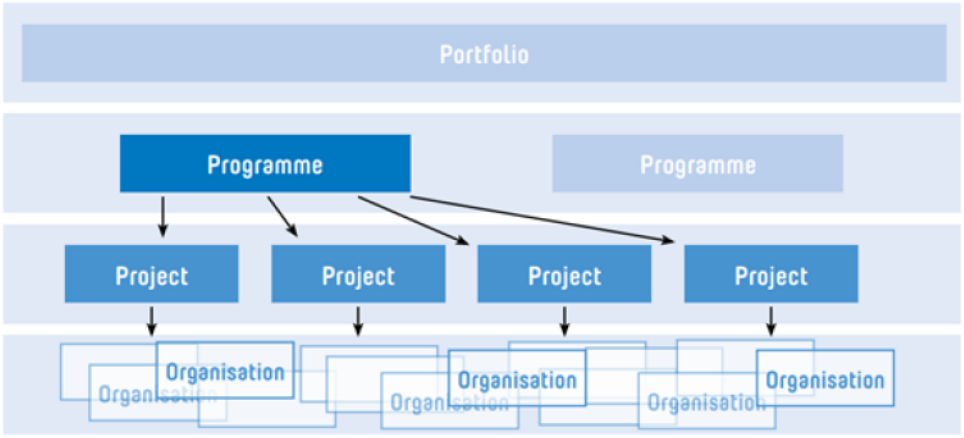
2.1 Portfolios, programmes and projects

The language describing the structures for funding time-bound research and implementation activities varies considerably in ways that can create confusion. For this report, drawing on language used by Buffardi and Hearn's (2015) study of multi-project programmes, we refer to three scales of organization: portfolio, program, and project (see Figure 1). Projects represent the smallest and perhaps the most familiar organizing structure. These are typically led by an individual or small group (often a Principal Investigator in research initiatives) and implemented by one or more organizations, have a driving question or challenge they seek to address using specific geographical, thematic and methodological foci.

Programmes, the second order of organization, are represented by the eight initiatives under study here. In most of these eight cases the programmes can be described as "multi-project programmes," meaning they support a number of projects, typically funded through a single mechanism and addressing a common, broad theme. The projects are implemented across different locations by different organisations, and may target different population groups using different interventions, but are grouped together under a common set of high-level objectives, often under a single results framework. Importantly, there is an expectation of some level of interaction between the projects (Buffardi and Hearn, 2015).

The third and highest-order of aggregation here is the portfolio. This is the term we use to refer to the CLARE portfolio. Typically, the portfolio scale has been largely administrative; a means of 'tagging' particular types of fund investments (by aim, region, or form of investment), or organizing teams in funding agencies. In CLARE, however, there is interest in seeing this portfolio scale take on a more dynamic role, adopting some of the functions typically found at Programme level at this higher level of coordination. We reflect in detail on the distinctions between these scales in the sections that follow.

Figure 1: Portfolios, Programmes and Projects (Buffardi and Hearn, 2015)



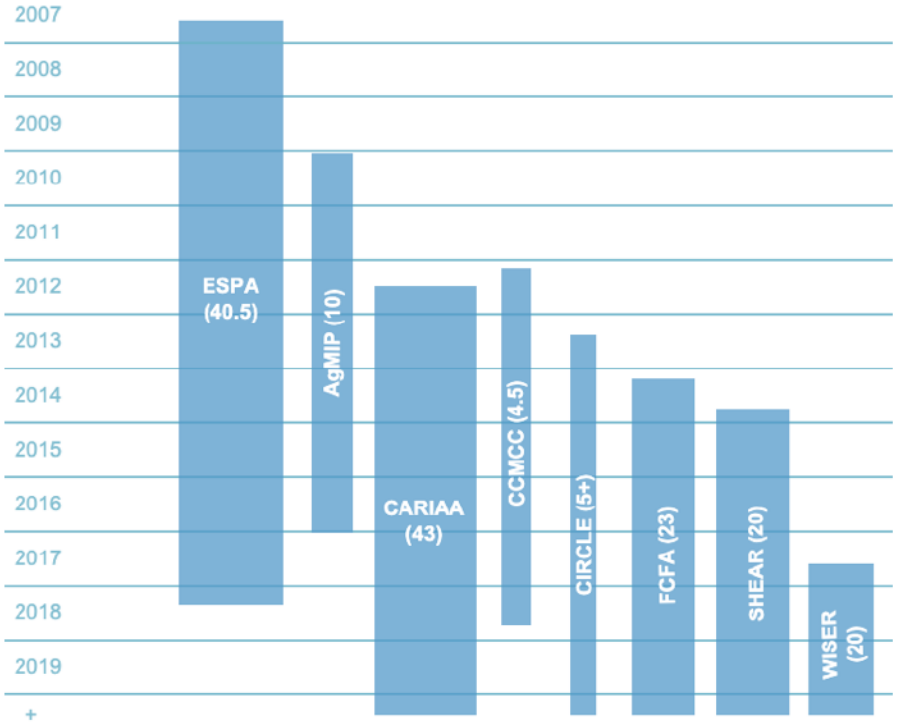
2.2 Programmes for assessment

Eight DFID-funded applied climate programmes were implemented between 2007-19 and varied in terms of size, duration and objectives (Figure 2; see Annex 1 for profiles of each):

- Agriculture Model Intercomparison Project (AgMIP),
- Collaborative Adaptation Research in Africa and Asia (CARIAA),
- Conflict and Cooperation in the Management of Climate Change (CCMCC),
- Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE),
- Ecosystem Services for Poverty Alleviation (ESPA),
- Future Climate For Africa (FCFA),
- Science for Humanitarian Emergencies and Resilience (SHEAR), and
- Weather and Climate Information Services for Africa (WISER);

We have also looked beyond this set of eight where appropriate, drawing insights from comparable initiatives including Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED), Unlocking the Potential of Groundwater for the Poor (UPGRO), Climate and Development Knowledge Network (CDKN), Global Challenges Research Fund (GCRF), and INASP.

Figure 2: Timeline and budget of initiatives (expressed in millions of GBP)



Notes: Programme budgets are based on best estimates from annual reports available at Devtracker and DFID annual reviews. Given variations in budgets and exchange rates some discrepancies may exist.

Figure 3: Summary of eight DFID programmes and their support functions

Program	AgMIP	CARIAA	CCMCC	CIRCLE	ESPA	FCFA	SHEAR	WISER
Funder	DFID	DFID-IDRC	DFID-NWO	DFID	DFID-NERC-ESRC	DFID-NERC	DFID-NERC-World Bank	DFID
Fund manager	DFID	IDRC	NWO	ACU	NERC	NERC	NERC/World Bank	UKMO
Collaboration	Earth Institute	IDRC	CCMCC Secretariat		ESPA Directorate	CCKE	Red Cross Red Crescent Climate Centre/ Practical Action Consulting (added after start)	UKMO/ACPC
KM (Lead)			added yr 3	NRI				
Research uptake								Dedicated TRANSFORM project
MEL			CCMCC Secretariat					UKMO
Adaptive management								

2.3 Function areas in applied climate research programmes

'*Function areas*' are dimensions of programme design that are relevant for applied climate research programmes, namely: collaboration; knowledge management and brokering; monitoring, evaluation and learning; research uptake; and adaptive management. Our analysis of the five function areas was guided by key questions which we aimed to answer based on the evidence we gathered. These questions also suggest the way we have defined function area in question. They are:

- Research Collaboration: How do programmes encourage and support collaboration across institutions?
- Knowledge Management: How can programmes ensure that data and evidence emerging from research is documented and accessible within timeframes that allow it to be integrated into Programme activities?
- Monitoring, Evaluation and Learning: How can programmes track, assess, and learn from their performance at different scales in ways that can inform current and future practice?
- Research Uptake: How do programmes scale research results beyond study sites and pilots to impact policy and practice in different places and at different scales?
- Adaptive Management: How do programmes react to internal or external changes in their environment, and respond to unexpected or emergent opportunities?

Function areas tend to be interconnected and can have a high degree of overlap in practice. The report is structured so that each function area is standalone, which leads to overlapping between some function areas. The cross-cutting elements are emphasised in the recommendations and conclusions.

2.4 Key assumptions

Before we delve into our analysis we start by outlining a set of assumptions, informed by our review and our discussions with IDRC and DFID representatives. These assumptions play an important role in limiting the potentially limitless range of possible options for CLARE's design.

CLARE seeks to add new value at the portfolio scale
The CLARE portfolio represents a new way of approaching the coordination of research investments on climate and development at DFID and IDRC. While fund portfolios have existed in the past (DFID's International Climate Fund portfolio being a recent example), the ambitions of value addition through coordinated support to grantees under the portfolio represents something more akin to what has typically been found at programme scales. This represents a challenge, but also a considerable opportunity to gain new insights and achieve greater impact across the scale and breadth of investment that CLARE will represent.

Coordination and support functions will not be limited to the portfolio scale
While we have assumed that CLARE will play a coordination and support role in line with the five function areas reviewed here, we assume that this will be *in addition to* similar functions at the programme scale, not instead of them. We assume that DFID will use a significant portion of CLARE resources to invest in multi-project programmes similar to the eight reviewed here. These programmes have proven benefits and efficiencies in comparison to funding individual projects (Buffardi and Hearn, 2015). These future programme investments are likely to continue to have function areas like MEL and KM/KB built into their design. We note that care will be needed to avoid unnecessary duplication of these functions, while seeking interoperability. We also assume that not *all* investments through CLARE will be programmatic in nature as some funds may be disbursed directly to projects or through other avenues of investment.

Investment will be staged
We assume that funding calls and investments into research will occur in phases over the life of CLARE, leaving time to take stock of current investments and conduct adaptive management of the portfolio. We also assume some portion of these funds will be geared to responsive or opportunistic investments based on ongoing work in the portfolio. This means that "membership" in CLARE is likely to be dynamic with some projects or programmes concluding as new ones are initiated. Lessons from programmes such as ESPA and SHEAR may be instructive in this regard.

Significant financial investment will be set aside for these functions
None of the recommendations that follow can be achieved without adequate investment. Estimates from our interviews with key informants suggest that adequately supporting function areas can require up to 20% of programme budgets, making this a significant area of investment[1]. Travel for coordination and planning events is an area that has been consistently overlooked in past programmes. We assume that this is understood and anticipated.

[1] Our estimate of 20% is based on past studies costing of one or more of the functions area. M&E, in particular has been costed at between 5 and 20% of budget costs, while IDRC estimates having invested as much as 25% on

2.5 Methodology

This research was conducted between June and August, 2019. It draws on programme documents (including formal reports and evaluations) and secondary literature relating to recent scholarship on each of the five function areas, including outputs from the eight programmes (e.g. Cundill et al, 2019; Cochrane and Cundill, 2018; Wells, Ryan and Fisher, 2018). In addition, 18 semi-structured interviews were conducted with representatives from the funders (DFID and IDRC) and representatives of programmes concerned with the five function areas. The aim of the interviews was to fill gaps and gain perspectives on the pros and cons of different approaches (see Annex 2). We also draw on our own extensive experiences with applied climate research programmes.

2.6 Limitations of the study

A key limitation to our analysis and the specificity of our recommendations is that we have limited insight on how research will be commissioned under CLARE. As highlighted in our recent analysis (Jones et al, 2018) and in interviews undertaken for this study, commissioning processes have a strong influence on group cohesion and research integration. Recommendations are prefaced with the assumptions we have adopted regarding the type of commissioning process applied for CLARE. A different commissioning process could very well yield different results[2].

A related limitation concerns the range of possible options for each of the five function areas under study. Considering that each function can be designed in a range of different ways, using a host of different commissioning processes, and operating at one or more scale of action (portfolio, program, or project), the range of possible permutations is huge. It is therefore beyond the scope of a rapid scoping study to provide an exhaustive analysis.

An additional limitation to note is around the scope of the analysis. While each initiative has its own history and set of circumstances that help to explain why particular decisions were taken or outcomes were or were not achieved, it is beyond the scope of this report to provide a comprehensive recounting of all the factors that led to particular decisions or outcomes.

Lastly, we wish to emphasize that this report is not an evaluation. We base many of the findings and recommendations on a limited set of interviews and reports, as well as our judgement. We also lean heavily on our own judgements about the successes and failures of each of the programmes. Much of this is based on our collective experience in having worked on and researched large multi-project climate research programmes. This includes the support we have provided in the design, delivery, monitoring and evaluation of most of the eight DFID programmes reviewed here. We recognise that this involves some degree of subjectivity, and

research uptake in CARIAA. Some of these costs would be borne on other budget lines (for example travel and publication) making 20% of dedicated funding a reasonable estimate.

[2] Programmes covered in this review used a range of processes to commission research, from calls led by research councils or funding agencies to seed or catalyst grants, as well as multi-stage concept development processes that led to large consortium-style grants.

have tried to ensure that key insights draw on external inputs where relevant, and were carefully deliberated by members of the report-writing team.

3. Programme Function: Collaborative Research

3.1 Overview

The importance of collaboration in research has grown over time and is evidenced by the expansion of multi-project and consortium-based research. It has its roots in the emergence of interdisciplinarity as an approach to addressing real world issues, where the commitment of researchers and early fostering of cross-disciplinary interactions is paramount (Pittman et al, 2016). Collaborative research has more recently become popular in use-oriented and applied research to address development challenges and wicked problems such as climate change (Cundill et al, 2019a; Jones et al, 2018).

Collaborative research requires individuals to be willing to develop relationships and partnerships, and deal with disciplinary and geographical diversity in the process of finding common ground (Gonsalves, 2014; Cundill et al, 2019a). Consortia are a common structure through which multiple actors (individuals and institutions) who are independent of each other come together to address a common set of questions (Greene et al, 2005; Wagner et al, 2005). In recent consortium-based applied research programmes, novel collaborations between NGOs, government agencies and the private sector, alongside researcher institutions, have fostered new ways of working and enabled new pathways to uptake. There has also been growing evidence of partnerships between the Global North and South. This raises questions around how knowledge is generated and given value as well as potential power asymmetries in the control of research agendas (Wagner, 2018).

Programmes can be designed to consider the systemic and design features that enable collaboration. Alongside the growth in recognition of the importance of collaboration has been a change in the way that it has been approached in research programmes (UKCDS, 2017). In the past, many research funders placed significant emphasis on developing partnerships and networks through projects – and in such cases collaborations in the form of communities of practice, networks and co-applications for funding were an outcome, for example (Cochrane and Cundill, 2017). Many programmes have been designed with a “catalyst” or “exploratory” funding window in which trust, partnerships and networks are supported to grow with a view to future collaboration; for example in ESPA (Wells et al, 2018; Research into Results for the ESPA Directorate, 2018) and UPGRO (Camacho, 2017). More recently, and partly as a function of the success of such projects and early initiatives to build partnerships and networks, programmes have been able to rather shift to seeing collaboration as an enabler of the desired research and impact outcomes (Cochrane and Cundill, 2018).

As well as systemic and design features, effective collaboration is also contingent on relational features (Cundill et al, 2019b). Building trusted relationships between people with different

competencies, interests and capacities requires strong leadership and effective coordination to draw out willingness on the part of individuals, as well as appropriate incentives (which may include, for example, peer-reviewed papers for a researcher, or evidence of impact for a practitioner)(Lonsdale and Goldthorpe, 2012; Wells et al, 2018; Currie-Alder et al, 2019; Cundill et al, 2019b). Instead it is necessary to take resources, time and space to actively consider what teamwork should look like and to make explicit the different assumptions and expectations that parties have of each other, as well as to align objectives and methodologies (DECCMA, 2018; Wells et al, 2018; Research into Results for the ESPA Directorate, 2018).

Enabling effective collaborative models requires changing the “upstream” approaches of research funders in the way that programmes are designed (Jones et al, 2018). Novel collaborations have resulted. ESPA, for example, marked the first time that DFID collaborated with the UK research councils (Wells et al, 2018). This collaboration has paved the way for many subsequent programmes being funded by collaborations between research funders, including FCFA, SHEAR and WISER (DFID and NERC) and CARIAA (DFID and IDRC) among the eight; and others including UPGRO (DFID, NERC and ESRC).

3.2 Approaches and architectures

Table 2 summarises the approach to supporting collaboration employed across the DFID programmes and Figure 3 shows how, in some cases, collaboration was managed by the Fund Manager (e.g. CARIAA and WISER) whilst in others it was tied up with separate KM units (e.g. SHEAR and FCFA, where the name of the CCKE expressly refers to its coordination role). Recognition of the importance of establishing (funded) structures for collaboration is manifest in changing approaches over time (Table 2). In ESPA, for example, although collaboration was a key aim of the program, as a forerunner in the field there was little evidence available to say what this might look like. The ESPA Directorate was an independent body charged with coordination, and managing related programmatic functions such as research uptake and MEL, but it provided limited support for collaboration. When projects funded under the Programme (particularly in the early years) identified opportunities for cross-project collaboration there was appreciation from the Directorate but no specific funds available to support. As a result, cross-project level collaboration tended to be organic, driven by the commitment of individual researchers and projects – and typically their own ability to procure additional funds. Likewise, in CCMCC the lack of collaboration structures (or a “knowledge facilitator”) and plans for collaboration at the start of the Programme impeded the potential for the Programme in this regard (Aidenvironment, n.d.) This is in contrast to more recent (and larger) Programmes such as CARIAA and FCFA where, building on this learning, flexible funding was available to support emerging collaborative opportunities through the Opportunities and Synergies Fund and the Applied Research Fund, respectively.

Table 2: Summary of collaboration structures across key DFID-funded programmes

	Collaboration
CARIAA	Strong inter- and trans-disciplinary collaboration within the Programme (and reflected in participating projects as a result of the design of the call which specified this). Coordination mechanisms set up and coordinated by the IDRC Programme officers utilising online collaboration spaces (a knowledge management platform and communication space under the Google Apps system). Explicit coordination mechanisms for management (PIs and consortium coordinators) and working groups for programmatic function (e.g. MEL, knowledge management and communications), cross-consortium themes (e.g. gender and equity, economics) and geographical areas (for countries with more than one consortium in operation). Face-to-face meetings through Annual Learning Reviews. Fixed and flexible funding available to support long-term and emerging collaboration opportunities (e.g. for cross-consortium synthesis).
SHEAR	Knowledge broker function shared by Practical Action Consulting and Red Cross Red Crescent Climate Centre play some role in supporting collaboration, particularly as relevant for research impact. Examples include coordinating conference attendance and presence among participating projects. Collaboration among studentship holders is strong through a network that has dedicated meetings; and funds available to support exchange visits. They also try to coordinate face-to-face meetings around major events that projects will be attending.
CIRCLE	Programme design is based on recognising the importance of collaboration in academic development through funding fellowships for Master and PhD graduates to spend 12 months with a host institution elsewhere on the African continent (managed through the African Academy of Sciences, AAS). Evidence for effectiveness of the organisational capacity component was demonstrated in the additional funding attracted by donors via the Alliance to Accelerate Excellence in Science in Africa (AESA) component of the "Strengthening research systems for poverty reduction in East Africa" project (now also established in AAS)
AGMIP	Strong example of academic collaboration, growing to a community of 600 modellers. Under the guidance of a Steering Council there are institutional MOUs and partnerships with research programmes to use outputs. A coordination council is hosted at Columbia University and has led the production of team protocols to guide coordinated approaches to produce improved crop and economic models and the next generation of climate impact projections for the agricultural sector.

WISER	Two-pronged approach: the Met Office acts as the fund manager for the East Africa component and provides technical oversight and leadership for funded projects that develop new climate services for East Africa; whilst the African Climate Policy Centre (ACPC) supports the Policy & Enabling Environment Component, with responsibility for identifying research needs, demonstrating benefits of climate services and advocating to policy makers. While no programme-level unit is dedicated to supporting collaboration, many of these functions are promoted by the WISER management team (led by UKMO). In addition, a stand-alone project was funded under WISER via an SSN-led consortium (TRANSFORM) with a mandate to support cross-project dialogue and collaboration.
ESPA	Largely coordinated by the Directorate, the capacity of which seemed to expand over time as a result of learning and filling of intended staff posts. Face to face collaboration opportunities provided through annual science conferences were held from 2012-17 and special thematic events focusing on methodologies. Webinars were also held, mainly for informational purposes.
FCFA	Programme design and call specifications encouraged interdisciplinary and transdisciplinary collaboration within consortia. CCKE unit spearheads Programme level collaboration through regular calls for PIs, programmatic function working groups (e.g. for MEL) and coordination of thematic synthesis products agreed at a mid-term Programme conference; as well as thematic webinars (many in partnership with other relevant organisations, for example USAID). An Applied Research Fund and Mobility Fund provide flexible funding on a competitive basis for emerging issues and to allow exchange visits (although not necessarily cross-consortium).
CCMCC	No dedicated unit or mechanism was in place to ensure collaboration from the start of the project – which was identified in the final review to be a weakness. Although there was a small budget for knowledge exchange, interest and uptake was patchy and reflected individual commitment (although some regional and thematic events were held). Annual events were held to bring together projects but, without strategic oversight, their efficiency in enabling collaboration and knowledge exchange was questioned. CCMCC did have examples of effective academic-non-academic collaboration in project teams, which often had the effect of improved research impact.

Box 1: Case study - Approaches to collaboration in CARIAA

Collaboration was integral to the CARIAA Programme from the very start. Assumptions in the theory of change highlighted that "Consortia were expected to facilitate collaboration and knowledge sharing, leading to research findings and impacts that transcended individual partners' expertise" (DFID, 2012). The call for proposals specified multi-partner consortia with 5 partner organisations. In practice most consortia had many more partners than this, and they reflected disciplinary and geographical diversity, as well as the inclusion of non-academic partners, creating transdisciplinary collaboration.

Collaboration structures were established at Programme level from the beginning. These included working groups with geographical and thematic focus. Country engagement tables were set up for countries where more than one consortium were working; whilst thematic working groups were for

cross-cutting issues (e.g. gender and equity, economics, climate science) or function areas (e.g. coordination; monitoring and evaluation; knowledge management and communications). IDRC funded the development of an online knowledge management platform to support this collaboration using Google Apps (for document storage, shared calendar, and google hangouts for meetings and webinars). There was also a programme management committee, comprising PIs and coordinators from all consortia, which met monthly throughout the duration of the program. In order to feed into these programmatic collaboration fora, projects set up their own collaborating structures (e.g. work packages, country groups, management committees) to feed into the programmatic ones.

Annual learning reviews brought together representatives from each consortium to share findings and provided an opportunity for programme-level synthesis and potential impact opportunities. These face-to-face engagements also often catalysed development of cross-consortium applications to the Opportunities and Synergies Fund (OSF). The OSF provided flexible funding for emergent collaboration opportunities that involved more than one consortium. Over 10 diverse projects were funded this way, among them workshops to synthesise key findings relating to gender from across projects, development of learning frameworks for adaptation pathways and research impact, and synthesising country-level findings on migration in India.

The flexible funding mechanisms supported the organic emergence of cross-consortium collaboration that often extended beyond the scope (and lifespan) of the OSF grant. Several OSF grants were provided to enhance research impact activities (for example on the development of a learning framework for research impact, and guidance on how to generate stories of change). Momentum and growing enthusiasm for ongoing collaboration between the project level research impact leads led to the development of a community of practice that held further meetings, set up a working group through the online knowledge management platform and also convened sessions at major conferences, for example Adaptation Futures 2018.

Key outcomes from collaboration in CARIAA include:

- Communities of practice: For example an emerging research impact group;
- Collaborative publications: 96% of the 106 peer-reviewed papers were collaboratively written and, of these, 56% of co-authors resided in different countries, with nearly half of the papers were led by academics from the Global South (Cundill et al, 2019b); and
- Ongoing research collaborations: Subsequently-funded research projects that comprise CARIAA partners include the University of Southampton (DECCMA) and Jadavpur University (DECCMA) partnering in the NERC and ESRC TaSE (Towards a Sustainable Earth) project; and the University of Exeter (DECCMA) and Refugee and Migratory Movements Research Unit (DECCMA) partnering in the Safe and Sustainable Cities: Chattogram project under the Development Frontier Research Fund (ESRC and DFID). There have also been many examples of proposals submitted under various calls (including GCRF Equitable Resilience) that comprised groups of researchers from across various CARIAA consortia.

3.3 What worked and what didn't

The potential benefits of collaborative research for addressing real world issues at scale are well understood, but it is not without its challenges. Benefits accrue to the quality of research

outputs, including through synthesis, as well as to the generation of partnerships and capacity building, both to conduct research and engage with stakeholders (Lafontaine et al, 2018; forthcoming FCFA learning review). These benefits are evident at multiple scales - from Programme to consortium. A survey of participants in ASSAR, one of the projects under CARIAA, showed that the opportunities of collaboration – in terms of thinking and acting differently – was one of the most commonly-cited highlights. At the same time, however, the difficulties of collaboration were among the most cited challenges – in terms of relationships and failed teamwork and the day to day realities of having to communicate across disciplinary, methodological and geographical boundaries (Scodanibbio, 2017).

As the evidence base from collaborative research grows, there is also converging evidence on what is necessary in order to enable effective collaboration in practice. This can be divided into values and ways of working (or the relational features), and systems and structures (or the design and systemic features) (Table 3). Values and ways of working refer to personal and interpersonal characteristics that are important to make collaborative research effective. These are less within the sphere of control of funders, although of course individuals and networks that are suited to collaborative research are likely to be attracted to well-designed calls, and funders can emphasize their expectation of deep collaboration in these calls. Systems and structures refers to the range of mechanisms – ranging from informal to formal – that can enable effective collaboration in practice. These are relatively more within the control of funders, who can create supportive enabling environments for collaborative research to thrive through mandating or encouraging (and usually providing funding support for) the creation of these systems and structures. Programme design and structure, in turn, creates the basis for the structure of projects within the programmes - so that if there are functional working groups (e.g. for MEL) at Programme level, similar structures will end up existing in projects in order to generate the information necessary feed into them.

Working collaboratively creates transaction costs that do not exist for individuals working alone – and as the size and diversity of a consortium/Programme increases, the transaction costs increase accordingly (Cummings and Haas, 2012; Cummings et al, 2013). In CARIAA, where the total number of participants exceeded 450 in more than forty institutions across the four consortia, the critical role of full time coordinators was highlighted as essential to ensure effective communication and collaboration across many moving parts (Currie-Alder et al, 2019). Although the resources for a full-time coordinator are only likely to be available in programmes of a certain size, they are also a key feature of nested collaborative structures (from Programme to project level) which are also likely to be essential in effective attainment of other Programme functions, for example knowledge management and research impact. Within FCFA, one consortium did not initially employ a coordinator but soon realised the need for such a position. In CCMCC, the final evaluation highlighted that the presence of a “knowledge facilitator” with defined tasks would have greatly assisted with coordinating the development of cross-cutting insights, with implications for the potential for research impact (Aidenvironment, n.d.).

Costs are exacerbated by the geographical spread of partners, which make coordination more challenging, due not only to disciplinary norms and practices, but also languages, time zones, and cultures of communication. Although there are now opportunities to capitalise on remote

communication mechanisms (Skype, Google Hangouts, Slack and other online conferencing packages) these are contingent on reliable internet access, which cannot be guaranteed in all locations of the world. Whilst remote communication mechanisms are helpful, they cannot fully substitute for face-to-face contact, which tends to be much more effective in building trust and enabling efficient communication (DECCMA, 2018). Face-to-face contact is particularly important in the initial stages of Programme implementation, when partners do not necessarily know each other and face the task of identifying common interests and methodologies, and ways of working (Gonsalves, 2014; Cochrane and Cundill, 2018; Cundill et al, 2019b). With funding limitations for collaboration functions in mind, CLARE may seek to nest programmes in regions, which also build upon existing regional relationships (whereas in PRISE, within CARIAA, the diversity of countries - from Senegal to Tajikistan - presented some challenges).

Table 3: Evidence for, and examples of, enablers of collaboration

ʌel of uence funders	olers of collaboration		Evidence	Examples from programmes
	ıctures			
		:tive nested coordination ems (usually spearheaded coordinator)	Currie-Alder et al (2019), Cui et al (2019b), Gonsalves (20	CARIAA, FCFA, SHEAR, WISER
	ıes and ays of orking	ɔersonal skills and onships	Currie-Alder et al (2019), Cui et al (2019b), Research into Results for the ESPA Directc	
		mitment and willingness of iduals	Cundill et al (2019a), Currie-Alder et al (2019)	
		ing trust and identifying non interests	Cochrane and Cundill (2018) Lonsdale and Goldthorpe (2(Research into Results for the ESPA Directorate (2018)	

Since this process involves navigating different experiences, perspectives, priorities and practices, being explicit about expectations of different parties is important. A number of

projects, for example Hi-AWARE in CARIAA, codified working relationships between partners in memoranda of understanding (Mundy, 2018). Learning from experiences in DECCMA, where different communication norms and practices were unspoken and caused some confusion, the GCRF Building Research Capacity for Sustainable Water and Food Security in sub-Saharan Africa (BRECcIA) project introduced a communications code of practice early on to ensure clarity of expectations across all participants. Within ESPA, a key facet of equitable partnerships was to have a procedure for planned papers that was circulated to all project members to provide everyone the opportunity to say if they wanted to participate (Research into Results for the ESPA Directorate, 2018).

3.4 Fit with future work

Clarity on aims for collaboration

Collaboration and the building of relationships and networks is an important outcome where capacity building is an aim. However, more broadly collaboration is an important enabler of research impact, which is typically a key aim of DFID's research initiatives. Clarity on the aims of collaboration, and the design of structures accordingly, optimises opportunities for research impact. Joint development of programme theories of change which set out the expected contribution of collaboration can be helpful to this end. Collaboration is also essential for knowledge management and allows effective programme-level MEL, particularly evaluation and learning, as discussed in the following sections.

Assuming research impact is a key consideration for CLARE, then effective transdisciplinary collaboration is necessary – at both project and programme levels. One way to enable this is to consider a call specification that mandates both an academic and impact lead. This would then mean that the programme becomes a transdisciplinary network. Knowing the aims of collaboration also helps to determine who should be approached for partnerships. Whilst there is growing evidence of North-South and academic-non-academic partnerships, there is likely place for new partners, e.g. the private sector (Lafontaine et al, 2018).

Collaboration must be planned

Evidence from programmes to date shows that programmes that did not actively plan collaboration showed less evidence, both of collaboration itself, and the outcomes that result from it, for example in terms of research impact (for example comparing CARIAA with CCMCC). This is in contrast to programmes that actively planned for collaboration and put in place appropriate structures (and coordination/leadership) and funded them appropriately (e.g. Lafontaine et al, 2018).

The call design and specification can determine whether projects are collaborative (in an interdisciplinary or transdisciplinary way, and taking into collaboration between the Global North and South). However, for collaboration within a program, there needs to be a plan and budget for it at all levels of operation (e.g. portfolio, programme and project). The transaction costs of collaboration are high, and there is therefore a tradeoff between the size and diversity of a programme and the costs of ensuring collaboration within in. One way to manage this would be

to have a nested management structure: portfolio, programmes, projects, organisations (Cundill et al, 2019a).

Collaborative spaces aid coordination (and fulfilment of other functions: knowledge management, MEL and research uptake)

Evidence from the various programmes highlights the role of spaces for collaboration – online, working groups, exchange visits, and conferences/learning reviews. There are pros and cons of each, depending on circumstances. Ultimately it is possible to create incentives and spaces for trust to build in the hopes that collaboration results, but there is no guarantee that this will happen (Research for Results for the ESPA Directorate, 2018; Cochrane and Cundill, 2019). Funding of access of participants to an online space in CARIAA did not necessarily ensure complete uptake, for example, due to reticence of people to modify their own preferred systems and processes for file management and communication. Face to face collaboration is expensive but highly effective in terms of generating trust and building relationships that are essential for collaborative outputs to result.

Managing collaboration is essential throughout programme lifespans

Effective collaboration requires there to be dedicated strategic oversight, or a bird's eye view, of emerging insights from the research during the process of implementation. This is because project participants may be too involved in their own workplans to identify synergies that are arising at portfolio and programme levels. This strategic oversight can be provided by fund managers, independent units, or hybrid models that may be formal structures or more informal ones (for example cross-project management committees). More informal structures should be mandated in the call design so that projects are aware of the need to commit to them (and budget accordingly) (Harvey et al, 2017).

This oversight is also important since the need for, and quantity of, collaboration changes over time. A combination of the competitive tender model pitting consortia against each other to win funding with the need for projects to be able to generate some findings means that collaboration in early stages of programme lifespans is likely to be less than as the programme matures. Flexible funding enables optimisation of such emerging opportunities.

Accountability is important

Ensuring collaboration requires accountability and, like coordination structures, these need to be nested and embedded at different levels, from project to programme to portfolio. Programme design and call specification can mandate particular types of collaboration. However, where programme level collaboration is managed separately from funding - as is the case in all research council-managed programmes - it is divorced from funding mechanisms (for example SHEAR, ESPA, FCFA, BRACED). The body charged with collaboration at programme level should have funds available to provide "carrots", but similarly they should be able to apply "sticks" should projects fail to commit to participating in programmatic collaborative process. This is typically not the case model where the body charged with supporting collaboration is not simultaneously the fund manager responsible for disbursing monies.

Building on previous endeavours whilst providing opportunities for inclusion

The wide- and growing-variety of collaborative research projects on climate and development means that many individuals and organisations have already developed relationships and networks that they can capitalise upon within CLARE (e.g. Vincent et al, 2018). For some, therefore, there is less need for an inception phase. However, there will always be new individuals and organisations who wish to engage in collaborative research but are in the early stages of doing so, and thus still need to support to develop those networks. Particularly given the desire to enable equitable partnerships that includes partners from the Global South (including greater attention to fragile and conflict-affected states), and from outside the standard research environment, new design modalities can set the stage for effective collaborative research.

There are a number of mechanisms to support the development of collaborative relationships, and collaborative research. Sandpits, Action Labs, matchmaking workshops and catalyst grants provide exploratory spaces with the aim of building relationships and providing opportunities for co-designing subsequent proposals (Jones et al, 2018). Actively inviting "graduates" of past capacity building initiatives at individual and institutional level (for example through CIRCLE, IDRC's pre-CARIAA initiatives and the GCRF GROW program) supports inclusion, the development of equitable partnerships, and the new relationships necessary to address climate change and resilience. Multi-phase projects maximise flexibility to provide opportunities accessible to a variety of circumstances.

Equalising power relationships

Experience from past programmes shows that the contracting and funding arrangements within programmes are symbolically very important with regards to power hierarchies. Typically to avoid financial risk, long-established Northern institutions have been preferred as lead organisations through which funding is channeled as it creates a lesser burden on fund managers. However, this reinforces power dynamics. In contrast, equitable partnerships were integral to the ESPA program, and, for many researchers in the Global South, collaboration under this programme marked the first time that they were recognised as equals and received their funding directly from the research councils (Research into Results for the ESPA Directorate, 2018). A similar process was followed in CARIAA, with two of the consortia led by Northern institutions (one university and one think tank) and two led by Southern institutions (one university and one intergovernmental organisation), with funding provided directly to the main consortium members. This trend for Southern partners to be individually contracted and receive monies direct from the fund manager, as opposed to through a Northern partner, played a significant role in flattening unbalanced power hierarchies and enabling more equal collaboration.

4. Programme Function: Knowledge Management & Brokering

4.1 Overview

The rise in programmes on climate and development has been accompanied by a rise in dedicated knowledge management or "learning" partners tasked with working across the programme to ensure that emerging knowledge is documented, shared, translated into appropriate language or formats, and kept accessible for future reference (Buffardi et al, 2019; Jones et al, 2018). The range of responsibilities assigned to these partners varies widely, and often includes activities from across the function areas covered in this report (MEL, research uptake, etc.), as well as responsibilities that more closely resemble programme management than knowledge management (see Buffardi et al, 2019, p. 9).

Early work on KM tended to focus on the codification, storage of explicit knowledge contained in knowledge products (reports, data sets, meeting minutes, etc.). Scholars and practitioners soon recognized that much of an organization's knowledge is in fact *tacit* rather than explicit, and thus embedded in individuals and their practices, but not documented. This led to a shift in emphasis from setting up knowledge infrastructure (databases, knowledge platforms, etc.) to establishing practices for two-way knowledge exchange and knowledge brokering. Most recently, attention has shifted to more *emergent* forms of knowledge embedded in networks and collaborations, which has given rise to an emphasis on knowledge co-production as a form of collective sense-making (Buffardi, Harvey and Passanen 2019). For the purposes of this study, and this function area in particular, we use the combined terms *knowledge management and knowledge brokering* (KM/KB) to refer to these sets of processes, systems and practices, particularly as they relate to research partners themselves (whether members of the portfolio, programmes, or projects). Outward-facing knowledge brokering activities that target stakeholder groups such as policy-makers and communities may employ similar practices, and indeed be undertaken by the same teams, but are categorized in this study as *research uptake* activities (see Michaels, 2009).

Some important points from the literature include:

Recognizing the role KM/KB functions play
Studies consistently report that these functions are often not formally recognized, codified, or funded as specific roles within programme teams (Shaxson et al, 2012; Jones et al, 2018). This can lead to a lack of staffing and investment into the roles that, in turn, limits the effectiveness of these functions.

Pairing social and technological responses
Despite the dramatic rise in the availability and sophistication of information technologies, most KM/KB activities remain fundamentally *human* endeavours (Hammill, Harvey and Echeverria,

2013). As such, ‘hard’ systems such as knowledge platforms and databases remain important, but so do ‘soft’ systems such as social learning, knowledge brokering and intermediary work that enable the exchange of insights and knowledge from one person/group to another, and the joint development of synthesized understandings on the basis of that sharing.

A full-spectrum approach
Following some studies (e.g. Shaxson et al, 2012; Harvey et al, 2012), it may be helpful to think of KM/KB work as a spectrum of activities, ranging from informational (enabling access to knowledge) to relational (enabling connections and collective sense-making), and systemic (addressing wider barriers to sharing and innovation). Attention to the full spectrum of activities is needed to optimise the use of emerging knowledge in programme activities.

Capacity considerations
While there is widespread use of dedicated and specialized support for KM/KB in multi-project programmes, distributed capacity within individual team members is also needed for these processes to be effective. In a systematic review of knowledge brokering functions in health-related settings, Bornbaum et al (2015) identified 10 main activity types, and a total of 40 discrete tasks that they classify as knowledge brokering, ranging from facilitating collaboration, to supporting coordination, and supporting skills development. The breadth of this inventory underscores the complexity of the KM/KB function, the need for a team-based approach, and the need to support project and programme teams in developing the relevant capacities (Mundy, 2018). On a more positive note, KM/KB competencies and strategies feature a close overlap with those found in research uptake, though the conditions for success for each may differ. Thus, it might be that gains can be made in both function areas through investments into building capacity within project and programme teams.

Systemic and structural considerations:
Important structural factors that may present barriers to effective KM/KB. Tsai (2002) notes how formal hierarchical structure and centralization can have a significant negative effect on knowledge sharing, while informal lateral relations, in the form of social interaction, have significant positive effects on knowledge sharing. This positive effect is mitigated, however, when teams are forced to compete with each other for internal resources (Tsai, 2002). This mitating effect can be countered through increased interaction and permeability between teams (for instance, allowing teams or sub-teams to access funds collaboratively) as a form of “coopetition” (Tsai, 2002). Additionally, Larsson et al (1998) note how dynamics of power, opportunism, suspicion, and asymmetric learning between partners create barriers to collective knowledge development, and thus call for developing transparency and receptivity within alliances.

4.2 Approaches and architectures

All of the programmes reviewed featured attention to some form of (internal) knowledge management and knowledge brokering, though the level of emphasis as well as the modalities for supporting these functions varied considerably. The level of emphasis ranged from intensive

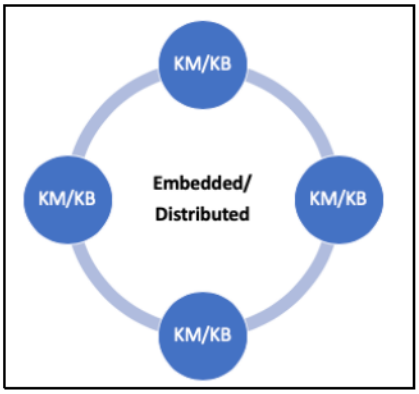
approaches, such as BRACED, CARIAA and CDKN featuring dedicated IT systems, working groups, internal newsletters, and clearly-defined internal governance mechanisms, to instances where internal KM/KB was seen to be introduced somewhat as an afterthought (after projects had been selected and research had started), or was largely abandoned due to lack of buy-in.

In terms of the modalities for supporting KM/KB functions, nearly all programmes featured some form of assigned or dedicated support. In some cases this was in the form of a dedicated 'knowledge manager' separate to the research and/or implementation teams, in others the support was provided by an assigned member (or members) of the research partnership, and in some cases there was a combination of assigned support to an external partner alongside distributed responsibilities by research team members (Table 4). Each of these models is presented in diagram form below, where the blue circles represent project teams/partners working under a common programme.

Table 4: Models of supporting KM/KB across programmes

Embedded & distributed	*Embedded & distributed with dedicated support*	*Embedded & assigned*	*Separate/External*
CARIAA	AgMIP; UPGRO; CCMCC	CDKN; CIRCLE; SHEAR	BRACED; ESPA; FCFA WISER

Embedded & distributed models

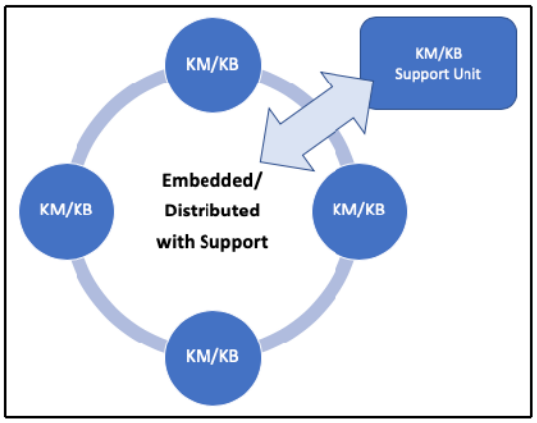


CARIAA's KM/KB stands out as the only instance where no single partner assumed leadership of the function area. Instead a working group was constituted of representatives of each of the four consortia as well as a representative from IDRC. IDRC played a role in establishing the underlying KM systems and governance principles at the outset of the program, and a third party consultant (Euforic Services) provided occasional call-down technical and capacity support, but was not involved in strategic planning or decision-making. Instead the programme-wide Knowledge Management and Communication working group oversaw planning processes with higher level decision-making sent up to the Programme Management Committee. This was perhaps possible due to the comparatively large size of CARIAA consortia, which allowed for the recruitment of dedicated staff with relevant experience who could assume some of these roles.

Embedded and distributed models with dedicated support

A model that was consistently highlighted by respondents is to have responsibility for KM/KB

distributed among a group representing the programme research partners, but with the support of a specialized agency able to bring KM/KB 'know-how' to their planning. In the case of UPGRO, for example, a Programme Coordination Group composed of project-level principal investigators was supported by a team from the Skat Foundation who have specialized knowledge and networks in this area. This model allows programmes to supplement their distributed capacity with additional expertise, while retaining a high level of direct involvement in ongoing planning and strategy work, though this depends on the level of fit between external support providers as well as the buy-in of programme partners (see UPGRO Case Study, Box 2). For CCMCC, the support role was assigned to one individual, tasked with linking across the KM/KB functions for each project in the program. They note in hindsight, however, that this was an underestimation of the size and complexity of KM/KB tasks.



Box 2: Case Study - Challenges to internal knowledge management in UPGRO

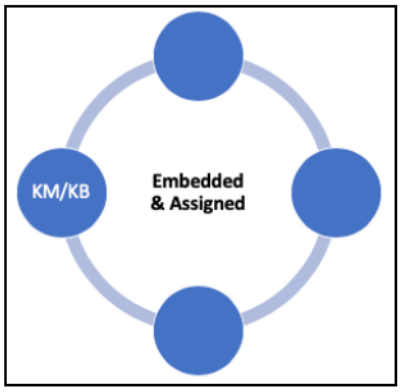
The Unlocking the Potential of Groundwater for the Poor (UPGRO) programme featured a dedicated team at the Skat Foundation tasked with supporting its five consortia on knowledge management and knowledge brokering. Knowledge brokering in UPGRO focused on mobilizing evidence both internally and externally (a convergence of knowledge management and research uptake functions to use the language of this study). Skat was uniquely placed for the task as they host the Rural Water Supply Network, a network of thousands of practitioners working on issues very closely aligned with UPGRO's focus. They were able to leverage that membership in ways that significantly raised the programme's profile. Promoting internal exchange and collaboration, however, was a task that faced challenges due to the way that the programme was established and research commissioned, norms amongst academic collaborators, implementation timelines, and the breadth of research foci within the program.

The competitive and 'blinded' selection process used by NERC to commission the research consortia negatively impacted researchers' willingness to collaborate across projects, share data, or share pre-published work. The research-council managed selection process also meant that projects were not necessarily designed to overlap or be complementary, which forced Skat Foundation to try to find the overlaps, or face limited buy-in to particular activities. Similar challenges were also linked to the diverse geographical focus of selected projects, which made linkages less clear. This case provides insights on how well-placed intermediary partners can lend important support to research programmes (in the right conditions), but also shows how even the best-placed support will be constrained by team dynamics and more systemic challenges.

Embedded & assigned support model

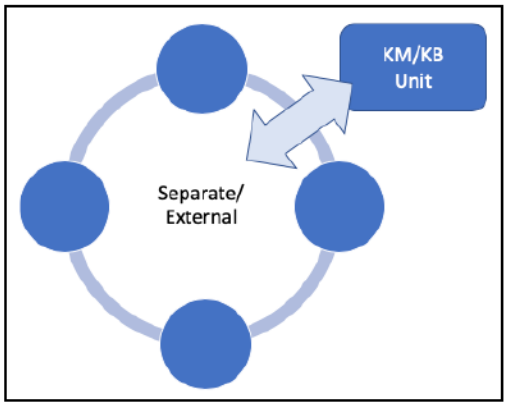
In the CDKN, CIRCLE, SHEAR programmes the core implementing partnership featured member organizations (ODI for CDKN, NRI for CIRCLE, Practical Action and the Red Cross Climate Centre for SHEAR) tasked with leading KM/KB activities. With KM/KB partners also embedded in the core programme work this model can provide a dedicated form of expertise

that remains closely tied to programme visions, aims and governance from the outset of the program. ODI's work within CDKN, for instance was noted by many respondents to be of exemplary quality. A drawback of this model, as with the external support model (below), is that responsibility may become excessively centralized - a feature that works against distributed KM/KB practice. This was noted, for instance, as a challenge from CDKN's attempts to get contracting partners to document lessons learned from their research activities. Because contracting partners did not always see themselves (and were often not treated as) as partners to wider network knowledge sharing aims, their incentive to share their experiences back to the network were limited. A similar experience could easily be imagined if funded projects do not see themselves as important contributors to CLARE's "membership" and ambitions.



Separate/external support model

The most commonly-applied model of KM/KB support from the programmes reviewed is through the contracting or commissioning of a separate knowledge management entity to work with the programme in question. Commissioning has typically been undertaken by DFID, even in programmes where research was commissioned through research councils (e.g. FCFA, ESPA), at times leading to concerns about a lack of alignment between programme requirements set out for research consortia and the expectations of consortia embedded in the terms of reference set for the KM/KB partners. This model of support offers funding agencies flexibility in terms of how and when they commission the KM/KB support, and allows them to run commissioning processes that specialized agencies or consortia. While this has enabled the production of high quality, and sometimes impactful knowledge syntheses and similar products produced *on behalf of* research partners, it hasn't always led to coherent collaborations that support collectively-owned or co-produced knowledge. Criticisms have included poorly-timed and under-financed integration of KM/KB functions (noted in the case of BRACED), and a lack of communication and trust-building between research consortia and KM/KB partners, whom they may see as working towards their own interests rather than adding value to research activities.



4.3 What worked and what didn't

As the previous sections have highlighted, while there is consensus on the importance of KM/KB functions in large, distributed research programmes, views on how to best structure these functions are diverse. We remain in a period of experimentation, where there has been limited robust assessment of the effectiveness of particular KM/KB models (Jones et al, 2018).

The following lessons emerge from this review of the literature and the experiences from across these different models of practice:

Shared Ownership and Responsibility for KM/KB

Shared ownership of KM/KB processes, products and priorities is important. Even if adopting a model of separate/external support like FCFA or BRACED, it is critical to ensure that priority setting has been agreed collectively, and that research and project implementation partners feel they have a voice in the KM/KB processes. This can avoid KM/KB being perceived as extractive, disconnected from research agendas, or impinging on researchers' intellectual property, as was reported in some of the cases studied. Building shared ownership is challenging if accountability and priority setting for KM/KB are kept separate from those of research. If KM/KB functions are commissioned or staffed separately, or have a separate start date from research partners, anticipate that time will be needed to build trust and connection - and that joint outputs over that period may be limited. Co-producing shared theories of change that set out the contributions of KM/KB to overall programme success is helpful for exploring how this function can add most value from different partners' perspectives.

Within research projects/consortia, shared ownership is equally important if KM/KB processes are to draw in broad-based tacit knowledge, particularly from regional partners. To address this, teams should identify champions at 'lower' orders of collaboration (field-based teams, non-lead partners, early-career researchers, etc.) and ensure they have a voice in KM/KB functions and processes (Prakash et al, 2019), and that they can access resources to support this work in their own work contexts. This distributed leadership can also help in diagnosing barriers to participation that may be related to connectivity, language, organizational cultures, etc. Note that this distributed approach does not substitute for dedicated and resourced support on KM/KB practice needed for ongoing oversight and quality assurance (e.g. maintaining systems, curating content, organizing meetings, etc.).

Identifying incentives and barriers for contributing to KM/KB practices

Common themes across interview responses were that the complexity and level of skills needed across programmes for effective KM/KB was underestimated at the outset, and that it was challenging to keep research partners engaged in these processes. However, none of the cases reviewed conducted baseline studies of KM/KB capacities or incentives at the outset of the programmes, a missed opportunity for aligning programme systems with these realities. It is important to understand how incentives to contribute to KM/KB processes at portfolio and programme scales may differ by collaborator type (NGO practitioner, researcher, etc.) or level of seniority (Harvey et al, 2017), and the kinds of capacity support that might be needed to enable that contribution over a sustained period. The use of a KM/KB working group in the case of CARIAA allowed for a level of experimentation and dialogue where partners could manage processes adaptively and respond to emerging concerns. A budget for training, capacity support, and technical support, available from the outset of programme activities is essential to avoid system failures.

Two ways of incentivizing ongoing engagement with programme-level KM/KB systems were highlighted by a number of programmes:

1. Editorializing KM content through newsletters and social media in ways that focus on both people and products (e.g. CARIAA's ASSAR consortium had a weekly newsletter that combined new products with humour, personal news, and photos, which compelled wide and regular readership, see Currie-Alder et al, 2019)
2. Strategic use of comparative statistics and featuring of projects works can generate a sense of 'coopetition' between projects, provided they are not taken too seriously. They can also provide evidence of cumulative progress across the programme (e.g. the growing number of citations of programme outputs), as evidenced in ESPA and CARIAA.

Establishing shared and sustainable systems and practices

Even if there is a shared sense of ownership, KM/KB functions need to be sufficiently focused and streamlined to avoid overwhelming collaborators and ultimately becoming unsustainable. A few recommendations emerged from the review on this point:

- Prioritise a limited number of data and knowledge types/sources to focus on in order to avoid overload. Priorities should be agreed collectively, taking into account the knowledge needs of other function areas, particularly MEL and research uptake, as well as overall research and impact objectives.
- Build upon what is already being used and emphasize harmonized systems across scales (project-to-portfolio) to ensure that KM/KB content need only be collected once, that it can easily be shared, and that collaborators need only learn to work in a single system. A number of initiatives (e.g. CARIAA, FCFA, BRACED) used Google Apps, for example, as they offered a familiar environment for many collaborators. However, having multiple logins/passwords consistently created challenges for some, and others remained uncomfortable with the degree of openness that these systems imposed on collaborators.
- Consider what scale of engagement is best for particular types of KM/KB work. This may mean ensuring that higher order (portfolio-level) content is visible to those working at programme and project scales, or alternatively, that relevant information captured at programme level can be easily shared upward. Other KM/KB practices are better-fit to particular scales of practice and may not be readily scalable to higher order structures. For example, joint sensemaking of work in progress may not be feasible at portfolio level unless working with thematic sub-groups.

Thinking about legacy

An obvious, but consistently overlooked issue on KM/KB is that these activities grow in importance as research programmes approach their conclusion, but few programmes have effective legacy strategies. A number of lessons were raised concerning legacy plans, namely:

- The failure to leave additional time for knowledge brokering and synthesis at the end of the programme cycle was highlighted as a major barrier to programme impact. KM/KB work should extend beyond the programme research life-cycle to ensure that knowledge synthesis work can conclude. Funding opportunities for researchers to remain engaged

in these processes beyond the anticipated end of programme activities have provided strong incentive factors in some cases.

- The relatively short lifespan of projects and programmes creates problems for legacy data when they are stored on stand-alone platforms or websites. Consider integrating these into pre-existing systems (e.g. a number of projects have used WeAdapt as a legacy platform, and the European Commission is developing an open research platform) or having legacy data/outputs archived at a portfolio level, as has been done with the CGIAR using CGSPACE.

4.4 Fit with future work

As IDRC/DFID transition from a focus on programme-scale KM/KB towards planning at a portfolio scale, the challenge of establishing coherent, sustainable, and fit-to-purpose systems becomes even more salient. The insights from past programmes outlined above remain relevant to both the future CLARE portfolio, as well as to the programmes it is likely to support. The longer-term nature of CLARE also offers unique opportunities to foster emergence and adaptiveness in developing KM/KB systems and practices, carrying effective approaches from one funded programme to the next, and developing a community of practice on KM/KB at the portfolio scale. With this in mind, the CLARE design process should consider the following:

- Focus on people, not just products or systems, but look at how technology can enable the work. CLARE will likely bring together a vast number of collaborators, making face-to-face engagement at portfolio scale nearly impossible, but effective curation, signposting and editorializing of KM/KB content can help to promote a sense of connection and coherence across the portfolio.
- Start with core set of systems and practices then collectively fill it in. Take advantage of the CLARE lifespan to gradually develop and tailor KM/KB functions alongside the programme membership rather than aiming for a fully-fledged system from the outset. This will help to build ownership, draw inspiration from effective practices at programme or project scales (see Harvey et al, 2017) and avoid unnecessary expenditures.
- KM on behalf of whom? Ensure there is clarity on lines of accountability. KM/KB systems that are perceived to be extractive exercises solely serving the funders are viewed with suspicion or even disdain. Ensure that there is a sense of mutual accountability for engaging in KM/KB, and look for ways to recognise the work that goes into contribution.

A life-cycle approach to KM/KB

Table 5 sets out priorities for KM/KB over the evolving portfolio life cycle. A similar evolution of priorities can be inferred for programmes operating on 5-year or greater timescales. It is important to note that the presence of an activity (e.g. synthesis) in one time-period does not imply it should only occur in that period, but rather that these should be areas of emphasis. Synthesis, for example, should be ongoing, but we expect efforts to scale-up significantly in the consolidation phase.

Table 5: Priorities for KM/KB, over time

Start-up: Years 0-2	Steady-state: Years 2-7	Consolidation and legacy: Years 7-10
Collective work aimed at: Building relationships between KM/KB focal points, governance representatives, support teams, and others who will be contributing to these processes, regardless of the model adopted Defining norms of KM/KB practice within the program/ portfolio Mapping and strengthening project/programme team capacities Establishing a shared identity Establishing a joint governance mechanism. Defining and communicating expectations and incentives for contribution. Scoping, developing and launching knowledge management systems.	Testing, scaling and 'sunsetting' activities and systems as needed Building recognition of systems and knowledge Deepening quality and depth of exchange Demonstrating the value of KM through co-production processes Growing the repository of shared knowledge Establishing and maintaining 'housekeeping' practices to deal with growing repository	Synthesizing higher-order (program/portfolio-scale) findings. Adding value to promising areas of project-level synthesis/legacy work. Documenting practices and lessons learned with collective, cross-scale reflections. Establishing programme legacy through open-access data and document archiving, network migration, infrastructure handover, etc.

Integrating knowledge management and knowledge brokering across scales

The benefits of a KM/KB system that is well-integrated across scales (from project to portfolio) have been described above. We have also noted the potential negative impacts of unnecessary duplication of functions, or imposition of onerous but non-essential functions. Combined, these make a careful reflection on the most appropriate scales to prioritise particular activities or decisions especially important. Table 6 proposes some priorities for particular scales of engagement. CLARE can promote coherence across these scales by encouraging cross-scale interaction through secondments of KM/KB focal persons, cross-scale working groups, and transparency and knowledge sharing between scales.

Table 6: Priorities for KM/KB, by scale

Scale	Priorities for KM/KB
Portfolio	- Emphasize data access and archiving policies/visions (e.g. document storage) - Identify and emphasize key knowledge needs. Limit focus to these. - Establish a forum for high-order synthesis of emerging results. Consider specialized competencies needed for this scale of analysis (systematic reviews, etc.) - Provide resourcing for cross-programme and legacy work.
Programme	- Establish joint enterprise, mutual engagement, shared repertoire of tools within programmes. - Address enablers and barriers to sharing and brokering (trust, incentives, competition, etc.) - Allocate flexible finance for responsive KM/KB activities.
Project	- Identify champions to provide project-level leadership (beyond positional leaders) & promote collective buy-in to processes and products. - Encourage participation in KM/KB systems and practices as a part of good research practice and project membership.

5. Programme Function: Monitoring, Evaluation and Learning

5.1 Overview

Robust Monitoring, Evaluation and Learning (MEL) is crucial to the design and implementation of large research programmes (UNDP, 2002; WHO, 2019). It involves collecting information about project activities, evaluating whether they're achieving what they set out to do, and learning about what worked and didn't. Crucially, information generated through MEL can also allow for adjustments and course-correction where needed (see section on Adaptive Management for more). A robust MEL strategy is contingent upon a Theory of Change (ToC) that includes information on knowledge transfer processes and will inform targets and indicators. It is often designed to suit the specific intention of the MEL process itself - whether demonstrating accountability to funders, showcasing and documenting lessons learned, or supporting the design of future programmes (Pasanen and Shaxson, 2016).

Unfortunately, MEL is often an after-thought in the design of climate and development research programmes. This is reflected in low levels of financial commitment, as well as poor integration of MEL into programme management structures. In the context of climate research programmes, this has often meant adopting light-touch MEL processes - largely focused on evaluation for donor accountability and reporting (Bours et al, 2014). More recently, however, larger climate programmes (including a number of the programmes profiled here) have started to think more holistically about MEL, and a planned and strategic approach to MEL is often linked to the Fund and Knowledge Management units.

5.2 Approaches and architectures

The research programmes mentioned in this report reflect a wide variety of MEL approaches. These range in complexity from AgMIP's light-touch model (with learning, reporting and evaluation functions each carried out in-house), to more sophisticated approaches under BRACED and FCFA (with stand-alone units dedicated to collecting evidence, monitoring it over time and feeding it back into programme operations).

While each programme tailored their MEL portfolio to their specific needs, a common recipe can be broadly laid out. In all cases, the primary monitoring tool is an annual review process. Annual reviews are used to collect valuable insights into the status of project activities in relation to respective logical frameworks and/or theories of change (ToCs). They are complemented in many instances by quarterly or six-monthly reviews. In larger programmes, annual reviews are conducted both at the project level (between projects and programme management) as well as the programme level (between programme management units and funding partners).

Box 3: Case study - Monitoring, Evaluation and Learning in WISER

The case of WISER highlights a number of important considerations for the design and running of a multi-project programmes. WISER was set up as a two-stage process, with an initial East-Africa component comprised of five 'quick start' projects, followed by a larger regional/national phase made up of twelve other projects. Many of the institutions are national meteorological services, alongside a range of academic, NGO and private sector partners. The UK Met Office (UKMO) also plays a strong role in delivering the WISER projects. At least four of the WISER projects are led by the UKMO, while a large number also feature UKMO as an active partner in project delivery. Moreover, as a program, WISER is managed by the UK Met Office (in conjunction with ACPC). Unlike many of the programmes of its size, there is no external knowledge management unit associated with the program. This means that UKMO are primarily responsible for most programme-level fund disbursement, knowledge management and MEL activities.

On one hand, the strong overlap between UKMO's role in commissioning, delivering and managing means that a considerable amount of knowledge and learning can be retained within the program, with fast feedback loops between project teams and WISER management. On the other hand, it means that MEL efforts have to be very careful in avoiding obvious conflicts of interest. This tension is especially apparent when carrying out the annual review process, with care needed to navigate internal relationships - while at the same time needing to remain fair and transparent.

One interesting step taken by the WISER team was to fund a stand-alone project dedicated to co-production and learning across the program. Under the name of TRANSFORM, it has sought to promote cross-project learning, akin to many of the activities normally held in a traditional knowledge management unit. By convening number of virtual and in-person learning dialogues, TRANSFORM has had success in helping projects to come together and reflect on lessons learned and common challenges. TRANSFORM has also carried out periodic surveys of project needs, concerns and capacity gaps that have proved variable in tailoring future capacity building activities. However, the fact that TRANSFORM was run as a stand-alone project, and was not embedded into the WISER management structure from the outset means that it has taken time to build the trust of project leads, with some degree of separation between it and UKMO.

Overall, experiences from WISER showcase the need to consider conflicts of interest amongst programme delivery partners. This includes establishing clear protocols on transparency and evaluation procedures. It also underlines the usefulness of embedding learning support into the programme's management unit from the very start - as the process of setting it up post-hoc complicates relationships between projects and those leading the learning process.

In most cases, project-level MEL is coordinated through a dedicated unit or team (typically aligned with the programme-level knowledge manager). However, the degree to which fund management and MEL roles are separated ranges considerably across projects. CARIAA and WISER are two examples of a linked approach, while FCFA has a stand-alone body through its CCKE unit. These units take on much of the responsibility for providing technical MEL support, oversight of timely reporting structures and facilitation of learning and reflection across projects.

Box 4: Case study - Monitoring Evaluation and Learning in BRACED

A number of interesting insights can be gleaned from how MEL was managed under BRACED. Programme-level management was largely separated between a Fund Manager (run by KPMG) and a Knowledge Manager (a consortium led by ODI). The KM's duties extended well beyond core knowledge management functions, and included promoting research uptake, collaboration and MEL responsibilities. Within this, a dedicated M&E consultancy, ITAD Ltd., had primary responsibility for supporting MEL

across the program.

A key role that ITAD (and the wider KM) played was development of tailored MEL documentation and guidance material for all BRACED projects. These were used by MEL officers within the projects to complete reporting requirements. While most of the documents were straightforward, they were inherently cumbersome as the projects were required to report on a large number of KPIs and logframe targets. Indeed, the guidance document for reporting against KPI 4 alone ran to 31 pages in length. This overwhelmed many BRACED projects with quarterly (and annual) reporting duties.

Another interesting component of the BRACED MEL approach was a sizeable fund set aside to conduct novel research deemed of relevance to the program. Here ODI and ITAD used a series of consultative exercises (principally through the annual learning events) to identify research that could help BRACED projects. Research was encouraged to address capacity and knowledge gaps that spanned multiple projects, and involved projects where appropriate (taking care to manage time-commitments). In a number of instances, ITAD partnered with BRACED projects to carry out rigorous evaluation exercises, assessing resilience-impacts on the ground. This was largely deemed as successful, with a wealth of research and guidance documents created - many of which helpful to development actors outside of BRACED.

The BRACED MEL experience highlights three important lessons for CLARE. First, projects often need help and guidance in satisfying evaluation and reporting requirements. Use of a specialised central resource to provide one-on-one support can be of considerable value, particularly when projects are deciding on targets and indicators. Secondly, care should be taken not to overwhelm projects with reporting needs. If programme-wide targets are chosen (such as KPIs), then consideration needs to be given to the time and technical requirements needed in reporting against them. They should also be of use to projects in reflection on their progress. Lastly, the availability of central resources to address ad-hoc knowledge gaps and commissioning of programme-relevant research can be of considerable use.

Lastly, most formal evaluations are typically conducted at mid-term and end-line periods to assess the effectiveness of projects and programmes. In most cases, these evaluations are carried out via independent evaluators, providing recommendations on successes and failures.

5.3 What worked and what didn't

In weighing up the successes and failures of past DFID programmes a number of key insights can be gathered. Below we detail those relevant to the design and delivery of CLARE.

Challenges of indicator selection

Perhaps the greatest challenge with monitoring and evaluation is choosing the right indicators to track. Logframes are often predicated on selecting specific indicators for both output and outcome-level processes. Yet, in many cases, project objectives are intangible and difficult to measure with a single indicator. For example, projects may ultimately seek to enhance the capacity of key decision makers, or build the resilience of people or communities on the ground. Both of these objectives face challenges in asserting causality and selecting appropriate indicators. To deal with this, many projects chose to use proxy indicators, or rely on crude quantitative metrics that loosely relate to the output/outcome of interest. Experiences from FCFA, WISER, CARIAA and ESPA all showcase instances of inappropriate use of monitored indicators - ranging from vague efforts to measure the percentage change in end-user perceptions to generic references to numbers of organisations with enhanced capacities.

In many cases, it may be better to focus on capturing detailed qualitative stories of impact (rather than ill-suited quantitative proxies). Projects can also benefit from the provision of dedicated MEL training and support (ideally from the Knowledge Management unit), such as those seen in BRACED, CARIAA and a number of others. Reflections from CCMCC also underscore the advantages of relying on Theories of Change and Impact Pathways to help guide MEL frameworks, rather than rigidly sticking to project logframes.

Different MEL priorities depending on funder/fund manager

A number of the programmes reviewed have been managed or commissioned via UK research councils. Feedback from these initiatives underscores tensions and trade-offs between monitoring norms and priorities of NERC/ESRC and DFID. Such differences were particularly pronounced during the early phases of ESPA, where reliance on the traditional research council model for monitoring and reporting '*automatically tended to result in more attention going to science excellence rather than development impact*' (Wells et al, 2018). Admittedly, these differences have subsided in recent years through closer engagement and adoption of MEL frameworks tailored to each program.

Discrepancies also apply to expectations around depth and frequency of reporting. Research councils have typically adopted a more autonomous process (allowing researchers some freedom in reporting against publication and spending expectations in due course) compared to the heavier pressures of DFID's traditional reporting model. Striking the right balance between these two approaches will have considerable implications for the design of MEL approaches - from indicator choices, to specification of ToCs and impact pathways.

Scarce examples of MEL on programme management

While a considerable amount of attention has gone into MEL of projects and tracking headline outcomes of the wider programmes, there has been little invested in MEL on the programme management units themselves. In most cases, the primary accountability and feedback mechanism for programme managers takes place through annual reviews submitted to the funding partners. Yet, this can often miss important insights and reflections from the projects themselves. Though some programmes include individuals from project teams within strategic oversight committees (e.g. CARIAA), there is often little in the way of formal feedback mechanisms to reflect on the direction of MEL, KM and programme management units.

One positive example is seen through FCFA, where surveys are periodically used to gather insights from projects into learning and support functions. However, more can certainly be done to make this practice more widespread and formalised, ensuring that programme management units are accountable not just to the donor but to the projects they serve. Interestingly, few examples exist of projects themselves evaluating the performance of programme management units (a practice we return to below).

Trade-offs between internal and external MEL functions

Incentive structures for engaging with monitoring and learning components will be very different to those for formal evaluation given the different sources of information and data collection that they require. It is imperative that an environment is created that allows projects to openly reflect on their successes and failures. They must also be willing to share lessons in a safe and constructive manner - not just so that they can take adaptive measures (if needed), but also so others can learn from their failures. Yet, projects members are often conscious of the fact that these reflections may feature as part of any evaluation - particularly in much of the Global South, where high dependence on a small number of funders means that a negative evaluation could jeopardise future jobs and funding. This not only jeopardises the potential for meaningful learning, it can serve to bias inputs gathered for evaluation.

Experiences from CDKN highlight this difficulty clearly, as priorities for the monitoring and learning functions between the fund and knowledge managers (namely PwC and ODI), were often at odds with those for the in-house evaluation unit (Intrac). With that in mind, care needs to be taken in ensuring that relationships between monitoring, learning and evaluation functions are clearly laid out - potentially being carried out by separate stakeholders. Above all, it is imperative that projects feel safe in sharing critical feedback, without jeopardising the ability of evaluation efforts to collect robust information on project performance.

Loss of valuable insights when evaluations terminate at project completion

One of the main weaknesses in evaluations of past climate research projects is that these efforts terminate as soon as (or soon after) the project comes to completion. This is not altogether surprising: MEL functions typically have to adhere to the same timelines as projects and programmes, meaning that data gathering and analysis of information is limited to impacts achieved during their lifespan. Yet, many project outcomes inevitably take time, particularly efforts to ensure that research outputs support decision makers on the ground.

Some of the larger programmes, such as FCFA, CARIAA, BRACED, have staggered their programme-level evaluations such that they begin while programme activities are ongoing, or they continue a short-while after projects have ended. This is an approach that may warrant replication under CLARE. However, it's important to recognise that even these shorter-term efforts are unlikely to gather many of the more meaningful impacts that might accrue many years down the line.

Burden of time commitments

One of the key lessons learned from programmes is that collecting and reporting against MEL requirements can be a heavy administrative burden. Insights from CARIAA reveal that many of the projects struggled to keep up with multiple reporting lines - having to monitor and track progress internally, and ensuring that evidence is being collected for quarterly monitoring and annual review processes. Indeed, these efforts often come at the cost of 'preventing them from doing the work that they need to do' (Gonsalves, 2014). Experiences from programmes such as CDKN and BRACED highlight the importance of ensuring that monitoring requirements are simplified and streamlined between scales and audiences.

5.4 Fit with future portfolio

Taking forward these lessons there are a number of recommendations relevant to the design of MEL systems under CLARE. To begin with, it is important that MEL is recognised as core to the functioning of CLARE. This means that MEL systems should be established prior to commencement, with clear guidelines and access to technical support for programmes and projects from the outset. It also means that MEL should be properly resourced, with dedicated budgets set aside accordingly.

A summary of scale-level priorities is provided in Table 7 below.

Table 7: Priorities for CLARE's MEL activities across scales

Scale	Priorities for MEL
Portfolio (with an independent MEL unit)	Focus should be on gauging the health and progress of higher-level objectives across CLARE programmes Collect and aggregate outputs/impacts from amongst the various programmes: - Outputs: prioritise relevant but simple quantitative measures that are easy to track and non-time intensive on projects (e.g. number of research papers, dialogue events, interactive sessions, etc.). Indicators can be common to all programmes and projects, allowing for ease of comparison. - Impacts/outcomes: gather stories of change and illustrative examples of policy engagement or contributions towards Impact Pathways. Should be done primarily through qualitative means, though can be readily aggregated to provide simple thematic quantitative overviews Support cross programme learning and interaction led by a small and independent unit with roles on promoting cross-programme learning with multiple roles: - Providing technical support to, and evaluation of, programme-level MEL activities (and ensuring representation and inputs from projects and programmes into the portfolio, for example through an advisory committee); - Commissioning stand-alone pieces of research (where relevant knowledge gaps may have been identified via programmes). For example, in the case of BRACED, this included stand-alone pieces of research on methods for measuring household-level resilience (that later fed into project-level M&E activities). In the case of FCFA's CCKE country and regional-level political economy analyses were done in the early stages of the programme to provide projects with better information on decision making contexts to support research uptake. - Ensuring learning passes across levels from project to programme to portfolio, and vice versa.
Programme (supported by a dedicated MEL manager)	Set up a dedicated programme-level MEL manager (ideally one for each program). Options are available through having MEL activities: formally embedded into the fund manager, to maximise internal sharing (similar to IDRC's role within CARIAA and UKMO's within WISER); embedded together with a stand-alone KM unit ,to encourage learning and permit adaptive management (similar to BRACED); or

	hosted as a stand-alone entity, to support independent evaluation and advice (such as INTRAC's role within CDKN) Focus on monitoring progress of projects and identifying capacity gaps that require additional support or course-correction. Provide technical support to projects in helping co-design MEL plans at various stages of the project cycle. Establish guidelines for rigour with regards to stories of impact and tracking against key indicators. MEL manager to perform a thorough (quasi-independent) review of all projects at the end-term (potentially at the mid-term too). Facilitate learning and lesson-sharing processes within and across projects. Key moments include annual reviews, mid-term evaluations, and cross-project face-to-face and virtual learning opportunities. Provide a safe environment for sharing information and reflecting on successes and failures Act as the broker for logframe/IP/ToC development and review between projects and the portfolio/funder. Help to ensure quick turn-around on decisions for changes to the MEL framework with portfolio and funders
Project	Focus on reporting and gathering evidenced stories of impact Encourage project partners to take MEL design seriously. Engage all relevant partners in the process of co-producing the MEL framework (together with the programme-level MEL managers) - to be treated as a live document that evolves over the course of the project. Consider appointing dedicated MEL officers, where relevant to ensure quality of data collection and look to programme MEL unit for training and capacity building. Reflect on whether targets remain viable as the project evolves, as well as the suitability of new targets if needed. Opportunities for flexibility should be made at the annual reviews and mid-term processes, with emphasis on years 1-2 of the project. Provide feedback on the effectiveness of the programme, as well as the relevance of the programme-level MEL manager Where clear outcome levels targets have been specified, consider implementing robust impact evaluation (though only in a small number of select cases). Strong support from the MEL manager needed.

Consider separating out ML from E

One of the key considerations for designing CLARE's MEL system is the relationships between monitoring, learning and evaluative functions. Conceptually these tend to be lumped together given their close overlap. Yet, experience from previous multi-project programmes shows that tensions can often arise in performing all three functions together. As mentioned earlier, part of the issue relates to incentives and trust. Formal evaluations are often seen as accountability checks and result in projects seeking to emphasize the positives of past performance. This can jeopardise meaningful learning from practice. Accordingly, there may be merit in separating

certain aspects of evaluation from the core work of the MEL unit, distinguishing between the learning and accountability dimensions of MEL activities.

In particular, it is worth considering whether mid-term and end-line evaluations are best carried out via the programme's MEL team, or through an independent (or semi-independent) entity. Choice of the latter would mean that projects are fully incentivised to cooperate and reflect on successes and failures, without fear of this reflecting directly into their final evaluations. Separation means that MEL/KM units have to worry less about the implications of grading projects harshly (and can concentrate more on providing support to remedy poor scores). It would also mean that any evaluations can be carried out impartially, and unaffected by the internal politics of the program. Separate functions could even extend to the responsibility for coordinating annual reviews - though again this decision should be taken by weighing up the implications for learning in adaptive management of the program. Naturally, this is a double edged sword: in many cases it is useful for those carrying out final evaluation to be conscious of the political environment within which decisions were made at the time. As with the case of CARIAA and others, external evaluators often struggle to fully grasp the working of large programmes through short contact periods. It is here where CDKN's model can be advantageous, with INTRAC maintaining a partial role within KM unit, though acting akin to an external evaluator, with few formal ties to CDKN management and programme delivery. A semi-independent body carrying out core evaluative functions may be of use, though both options present clear opportunities and drawbacks that the funder may wish to consider.

Evolving MEL priorities over time

To ensure successful delivery of CLARE's MEL processes, priorities in delivery will have to change dramatically as the project progresses (Table 8). In almost all cases, the ambitions of projects during their scoping phases end up being far removed from the reality of technical, political and socio-economic challenges that they ended up facing. With this in mind, rather than assuming that logframes, ToCs and indicators lists should be fixed and finalised prior to project commencement, there needs to be a considerable amount of flexibility built into the MEL system. As such, we recommend that the early stages of each programme (0-2 yrs) are focused on specifying key tracking components within each of the projects. This includes design of the overarching ToC, as well as the structure of deliverables and outcomes/outputs with the logframe.

Clearly, staged invesments into M&E are also possible, with greater resourcing reserved until the programme is fully up and running. However, we see a another option as potentially providing greater insights into past, present and future research activities. In this model, the first few years of CLARE's MEL activities would be spent retrospectively collecting information and learning on recently terminated DFID programmes (including a number of the programmes highlighted in this report). Given that many of the outcomes are only now starting to materialise, guiding key decision making processes, considerable value could be gleaned from commissioning a small number of retrospective assessments. This might also help inform which forms on MEL were used and useful. Findings could then feed into CLARE programmes,

ensuring that any lessons learned that weren't picked up by the end-line evaluations are acted upon.

Dedicated support from the programme-level MEL unit can play a key role, not only in providing advice, but in arbitrating on what changes are acceptable for sign-off. Short-term indicators can be chosen, with greater flexibility given to decisions around deliverables and targets towards the end of the project. Feedback processes here will have to be quick, with the quarterly and annual reports acting as useful prompts to encourage reflection.

Another recommendation would be to encourage all projects to carry out detailed political economy analyses at the onset of project commencement. This would be done to help understand how local/national decisions on climate-related issues are taken. These findings can not only help projects to better target project activities, but can help the evaluation teams to understand baseline conditions (and tease out causal mechanisms in comparing with outcomes at the end of the project).

As programmes and projects progress, the focus for MEL can start to shift towards consolidation. Logframes, ToCs/IPs and indicators can start to be finalised and agreed upon - drawing on realistic expectations for the project and factoring in any unforeseen circumstances. It is here that the mid-term review can acts a helpful medium in selecting targets (acting as the last chances for projects to seek amendments). Support from programme-level MEL units should also be provided in facilitating feedback sessions and allowing projects to reflect internally on progress towards the ToC.

Table 8: Priorities for MEL, over time

Years 0-2	Years 2-7	Years 7-10
Focus on specifying the ToC and Impact Pathway Collect baseline information on context and decision making environments (with support provided by the programme-level MEL manager) Identify temporary indicators that can be used to measure project-specific outputs/outcomes and establish baselines where necessary Encourage access to technical support through the MEL manager in picking indicators and establishing ways of tracking them	Focus on consolidating the ToC and Impact Pathway, as well as the indicators used to track progress Draw out lessons learned to improve the trajectory of project (and MEL framework) based on facilitated sessions with the MEL manager Start to collect qualitative stories of change to feed into impact pathways Encourage internal reflection and safe-spaces for discussing failures. Encourage lesson sharing across consortia	Focus on evaluating progress towards ToC and Impact Pathway. Scale up tracking of indicators and emphasise detailed stories of changes Consider follow-up assessments at the portfolio level focused on capturing the legacy of projects/programmes and overall contributions to the state of evidence on key themes Ensure that MEL manager continues support and functions past the end-point of projects Encourage write-up of lessons learned across the program

Treat annual reviews as an opportunity to reflect on the assumptions made in the proposal, and compare them with real world conditions on the ground	Treat mid-term review not as a grading process, but an opportunity to take stock and seek last-chance changes in path if needed	Treat end-term review as an opportunity to showcase successes, and help others to learn from failures

6. Programme Function: Research Uptake

6.1 Overview

Research uptake and impact are areas of increasing focus in all forms of research, particularly those addressing pressing challenges like climate change and development. Research uptake might mean through the inclusion of new evidence in an IPCC report, it may mean building the capacity of communities or decision-makers, it may mean improved service provision, or it may be mean changes to individual knowledge, attitudes and behaviors - depending on the objectives, activities, and audiences of the project or programme in question.

The 'how' of research impact is arguably more important than the 'what'. Oliver and Boaz (2019) suggest that a shift to greater emphasis on research uptake necessarily involves three transformations in the research-to-action landscape: transformations in the way that evidence is produced; transformations in the way evidence is translated and mobilized; and transformations in the culture of decision-making. Uptake may not only require robust, new evidence, but research methods and processes reflect the needs and preferences of intended users. This may mean integrating top-down and bottom-up approaches (Conway et al, 2019), ensuring methods align with the objectives (Cochrane et al, in press), and actively involving decision-makers in the research process through knowledge co-production (Harvey, Cochrane and Van Epp, 2019). In line with discussions on knowledge brokering above, knowledge intermediaries and translators remain a critical bridge between research and practice (Shaxson et al, 2012). These intermediaries may be independent entities like ClimateXChange in Scotland, a resource center and boundary organization designed to provide advice by pooling diverse sources of evidence and expertise, catering to the specific needs of decision makers (Wreford et al, 2019). Finally, effective research design and mobilization strategies must be complemented by the capacity of decision-makers to use evidence effectively. Civil servants in the Global South may lack access to information, or *accurate* information, resulting in decision making that is not aligned to needs (Duflo, 2017; Rogger and Somani, 2018).

The varied nature of research uptake makes the development of common programme strategies, frameworks and theories of change particularly important - but also complex since research-to-impact pathways are varied, lengthy and dynamic (Machen, 2019). This means that the MEL system needs to appropriately monitor relevant forms of change, and take into account contribution where full attribution is unclear. To date, the measurement of research uptake has tended to rely on a small set of quantitative measures (in the research space, this has often been tied to publications and citations), alongside a smaller set of qualitative stories of impact. Many of the metrics used to date, however, are poor indicators of whether a particular uptake strategy is likely to lead to the desired impact with the desired stakeholders. IDRC's RQ+ framework offers insight into how we might rethink the assessment of research uptake and impact, and link it to definitions of research quality (Lebel and McLean, 2018). Rather than peer review, impact factors, document views, and citations, the RQ+ approach explored how to measure originality, timeliness and usefulness.

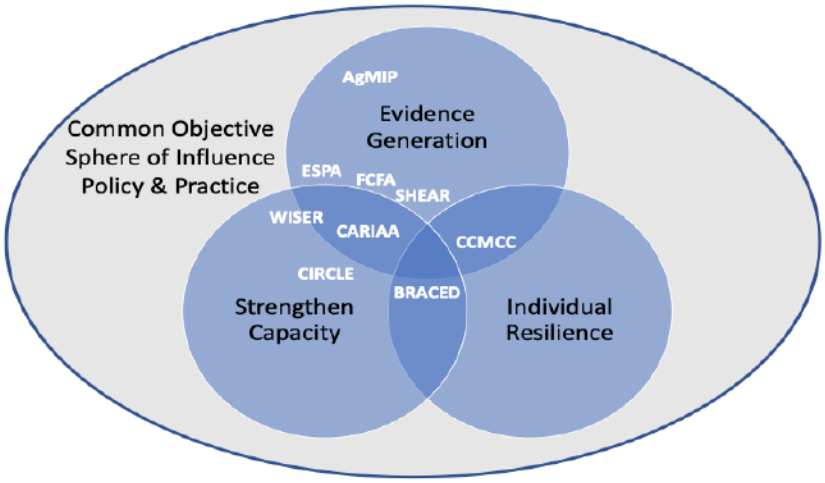
Establishing research uptake strategies and a MEL system are an important starting point, however it ought not be assumed that all the required capacity exists to implement it. Successful research uptake may require new actors or institutions with the necessary skills, knowledge, influence and trust. While this challenge is not limited to the Global South, capacity gaps in regions where CLARE intends to operate are prominent. This underscores the need to ensure that capacities for research uptake and evidence use are strengthened and that support is available to key actors and institutions expected to play intermediary roles. As an example of resources that can support capacity assessment, Bayley et al. (2019) identified 94 competencies for knowledge mobilization and impact, which they distilled into 11 categories.

6.2 Approaches and architectures

The programmes reviewed here had different primary objectives, which influenced how uptake was envisioned, reported on, measured and communicated (Figure 4). In some instances, programmes spoke about uptake as communications (e.g. producing briefs, holding a webinar) or dissemination (e.g. attending an academic or policy conference). For others uptake was understood in academic terms (e.g. number of citations; or citation in specific reports such as IPCC reviews). For yet others it was a form of stakeholder engagement, such as responding to evidence demands of decision makers. We envision uptake as influencing policy and practice, but we note that this imperative may vary among programmes in a future CLARE portfolio.

Several initiatives reported that research uptake capacity was added and/or research uptake strategies developed in response to funder requests. Some (e.g. AgMIP) did not explicitly target research uptake as policy and practice impact. In other cases, the projects were more exploratory or experimental, and therefore less clearly appropriate for direct uptake, such as the work undertaken by CCMCC (Box 5). There are some exceptions to this trend: CARIAA was more explicit about uptake at the outset (see Box 6).

Figure 4. Venn Diagram of Primary Programme Objectives (illustrative)



**The plotting of these primary objectives is not evaluative, but demonstrative of difference.*

Box 5: Case Study – Research for Impact in CARIAA

CARIAA featured careful thought on research uptake and impact from its design stage. This is demonstrated by the resources it allocated to these activities, amounting to approximately a quarter of budgets at programme and project levels. Research uptake featured as one of the three programme objective areas, and Concept Notes submitted at the commissioning stage required clear uptake strategies (CARIAA, 2013). While each of the four consortia funded through CARIAA integrated research uptake into their planning, at the programme's first Annual Learning Review it became clear that what research uptake meant varied quite significantly, with consortia thereafter investing resources into RiU support and learning. Following a mid-term evaluation that highlighted the opportunity, Research-into-Use (RiU) focal points were identified to form a working group that would meet regularly, sharing insights back to their respective consortia and at programme level. Each consortium developed its own strategies and roles for promoting RiU, and several consortia used CARIAA's Opportunities and Synergies Fund (an internal call for unallocated funding) to invest in deepening their uptake approaches, and to develop guidance to support learning on RiU (CARIAA 2017a). Programme-level leadership also produced a Guidance Note (CARIAA 2017b), which setting out key areas of activity relevant to research uptake, ways of assessing it, and pathways to foster uptake.

CARIAA partners and members also began to critically reflect on research uptake itself, arguing that some of the assumptions needed rethinking. A new approach of Research for Impact (R4I) sought to reframe research uptake as being built on collaborative ways of working, being iterative and opportunity seeking (CARIAA, 2018). The learning on uptake and impact was also explored through co-authored publications (e.g. Prakash et al, 2019), which explains why many other programmes cite CARIAA's research uptake work. As this learning evolved, however, it became clear that the MEL system, which worked well to track outputs, did not work as well to track outcomes and impacts, highlighting the need for future projects and programmes to consider the MEL aspects of uptake alongside the strategies early on.

Experience from CARIAA demonstrates that research uptake does not have a specific pathway or recipe. One consortium institutionalized stakeholder engagement as a work package while another began with a demand-led research approach to orient research to existing demands, while a third had a distributed network of uptake specialists to lead the process. Further, work by the ASSAR consortium in Botswana highlights that it was only after the consortium had developed an evidence base, built trust and established a network of partners and stakeholders that the opportunity for impact at scale emerged (see Prakash et al, 2019). These experiences suggest that while there are identifiable building blocks for enabling research uptake, there is no standard process that should be adopted across all projects and programmes.

Box 6: Case Study - Orientations of Uptake in CCMCC

The programmes analyzed in this report are of different sizes and operated on different time scales. CCMCC projects ran for 3-4 years, had a maximum budget of £500,000 and were more experimental or exploratory in nature. Compared to CARIAA (see Box 5), CCMCC projects were shorter in duration and smaller in budget. As a result, research uptake was envisioned and measured differently. As the main objective was to build the evidence base, research uptake was framed and tracked in an academic way (publications in high impact factor journals, citations), and to a lesser extent influencing policy. Uptake

strategies and dedicated staff emerged only midway through the program, and encountered a number of challenges. At that juncture, a knowledge broker was added to the programme to find linkages between projects, identify potential opportunities and share results with stakeholders. Learning from CCMCC is that strategies and staffing should begin from the outset, and that the knowledge broker role ought to be a set of roles (a team, not a single individual), ensuring that there are sufficient resources allocated to support knowledge management, organizing, communication, internal programme-level support and external influencing support.

Research uptake was not limited to the academic realm, but tended to be limited to activities among project partners. CCMCC's Final Report finds that at most scales (local, national, international) projects performed poorly on policy influence. However, akin to BRACED, a policy and practice uptake orientation may neglect changes for individuals and communities; in CCMCC the Community Based Adaptive Learning in Management of Conflicts and Natural Resources project reported transforming conflict into enhanced cooperation in 62 cases, using action research. The Final Report rated the project as 'very good' on community empowerment measures (participation / inclusion, concrete initiatives). While there are some questions about how this was measured (Aidenvironment, no date; Sultana and Thompson, 2018), it has the potential to fall outside of an uptake focused on policy and practice influence. CCMCC projects also reported positive change in work areas other than building the evidence base, such as the final evaluation finding many projects made significant positive progress in building capacity, which highlights that not all programmes and projects ought to be measured by the same yardstick of impact (Aidenvironment, no date).

6.3 What worked and what didn't

Each programme experienced its own strengths and challenges. A selection of what worked and what did not, organized by initiative, are presented in Table 9. Some of the insights described therein have informed the learning and lessons presented thereafter.

Table 9: What Worked and What Did Not, By program

	Worked	Did Not / Missed Opportunity
ESPA	The Directorate had an Impact Manager, charged with programme-level uptake planning and activities. It also offered an array of 'carrots and sticks' to keep uptake at the forefront. Introducing regional impact leads in Africa and Asia was a positive addition for enabling uptake. Brought in a Postdoc to work on synthesis (including an edited volume).	Uptake and impact functions were added and expanded in the latter years, but should have been established from the outset. Many of the funding calls were disconnected. This posed challenges for programme level collaboration and synthesis; creativity and exploration were required to find linkages within the portfolio.
CARIAA	IDRC enabled opportunities for uptake and impact beyond what individual consortia could have created. This included leveraging a programme advisory committee at key moments, as well as providing additional resources and personnel (postdocs).	IDRC and DFID networks could have been better leveraged to enable uptake. Suggested options include DFID country office involvement to attract by-in from other in-country stakeholders.

	In-country steering groups with external stakeholders played a strong role in enabling demand-driven research that led to uptake, as stakeholders become partners (PRISE).	
CCMCC	Community-level exploratory action research on conflict transformation had significant impacts (see Box 6).	Policy and practice influence was minimal, in part due to an academic orientation to uptake. Knowledge broker/uptake role was added later in the programme cycle and considerably under-resourced.
CIRCLE	In terms of strengthening capacity, building networks and opening opportunities, many of the fellows participated in the IPCC process.	Did not have uptake strategies. Uptake largely focused upon partners. Not fully tracking uptake or impact beyond partners. This is now being developed.
SHEAR	Uptake largely coordinated through SHEAR's dedicated KM unit. As projects were quite innovative, a broader framing of uptake allowed for flexible expectations, and thereby enabling new directions to be pursued.	Diversity of projects within portfolio made uptake and impact work beyond the project level challenging.
FCFA	Attention to geographic distribution of knowledge and knowledge gaps informed investment (as opposed to pre-determined countries or proposed locations from grantees). Small, flexible opportunities grants enabled pilots and experimentation, which supported co-production and research uptake. Projects worked at national and sub-national uptake while CCKE supported institutional and international uptake. These were complementary activities that fostered engagement at multiple scales. Qualitative reporting of uptake was an effective, time efficient, MEL mechanism. Annual summaries highlighted key uptake and impact activities.	Measuring the impact of capacity building for ECRs at a programme scale proved challenging. The lack of a baseline, comparative model resulted in a reliance upon qualitative stories of change, and thereby an inability to speak about impact at scale.
AgMIP	Initial demand-driven project addressed a critical challenge regarding crop modeling. This group of scientists went out of their comfort zone engaging in uptake activities; DFID pushed the projects, through which they made progress.	When uptake activities were undertaken, the target audience groups were quite narrow (researchers and a narrow set of end users). Policy and practice uptake was less effective. A limited amount of synthesis was undertaken.
WISER	Long-term relationships (the specific individuals involved) enabled activities to gain	Uptake efforts tended to focus on national, government actors (supply side) and

	traction and fostered system change regarding the analysis and communication of climate information.	improving technical capacities. However, the outputs could have better aligned with user needs. Programme could have fostered systems for needs assessments and feedback. These challenges were linked to the lack of a formal KM unit. Questions about sustainability of climate services following the end of project funding. Greater attention was needed to continuity of services.

Planning for uptake from the start

Many programmes did not have a clear definition of uptake, develop uptake strategies, or have staff to lead uptake activities, from the start. When absent, these needed to be built midway through, often creating pressures about additional expectations for individuals and partners, where budget may not be the primary prohibiting factor, but time commitments and a lacking foundation to enable uptake. Future projects need to be clear from the outset about what uptake means (even if broad in the form of an overarching framework), how that will be measured, reported and evaluated, develop living strategies for uptake, and have appropriate staffing (considering roles, competencies, geographies, languages, scales). As research and uptake are often collaborative, uptake teams benefit by conducting stakeholder mapping, engaging stakeholders, building trust, expanding networks, during the formative programme years. Conversely, these teams have limited effect when they are an add-on during the latter stages of the project cycle.

Underdeveloped capacity for uptake

In most instances, the programmes reviewed did not budget sufficiently for uptake activities, staff to lead on uptake or have explicit uptake strategies. All the programmes analyzed in this report had capacity building functions, to varying extents. One of the key lessons that emerged is that often the capacity gap was addressed by introducing an individual to the project or program. Across all the programmes, there was a recognition that the required capacity needs were much greater than anticipated. As research uptake transforms from being the task of an additional, often late, individual to a programme into a research uptake team, greater attention should be paid to the competencies required and how the capacity gaps can be strengthened. There is no recipe for staffing a research uptake team or an array of training such personnel ought to have; rather there are building blocks that ought to be sought, each project or programme building its own contextualized pathway to putting in place the enablers for uptake.

Budgeting for uptake staff and activities

Uptake takes time and resources. Programmes report that uptake was under-funded (e.g. ESPA only got impact funding due to an underspend) and under-staffed. In some programmes, there was resistance to 'localizing' uptake support (e.g. having in-country staff), when these efforts were successful and additional staff hired, the contribution was significant - and is recommended for future programmes. Additionally, in-country uptake staff should be embedded

in institutions, not as individuals, as that had limited their ability to engage as well as receive support.[3]

Building blocks, not recipes

There is no pathway or set of activities to uptake that all programmes and projects ought to follow. Focusing on the foundations that enable uptake, rather than following sets of specific practices, is recommended. This means projects and programmes should critically analyze and engage with operational contexts and take advantage of windows of opportunity. CARIAA identified six lessons for research uptake, specifically for influencing policy and practice (see Box 5 for additional details). These building blocks for uptake include: (1) sustained, collaborative relationships with stakeholders; (2) pair desired outcomes with flexible and iterative approaches; (3) develop usable MEL with feedback cycles to know what is working, and what is not; (4) use diverse multimedia communications, with clear messages, audiences and strategies; (5) ensure researchers have the capacity to support research uptake; (6) budget for dedicated and trained staff (Prakash et al, 2019).

MEL on uptake

Learning about how uptake happens is important. However, often uptake and impact is missed by evaluations. This is particularly the case for projects that have shorter timeframes (1-4 years) or are experimental (e.g. SHEAR), but it is also the case for longer-term projects that conduct evaluations within the final year or two, while the uptake work is ongoing (e.g. CARIAA and ESPA). In addition to reconsidering the timing of impact evaluations, there may be broader reconsiderations about evaluation in general. For example, ACIAR has funded *ex post* evaluations (the Impact Assessment Series reports, which over time have been both randomly and purposively selected). This need not require institutional change to implement; programmes could set aside evaluation budget for *ex post* evaluations. Another option, presented in the MEL section, is that activities in the early stages of CLARE include learning studies or *ex post* evaluations of uptake and impact in the DFID- and IDRC-funded programmes analyzed here.

Design of research uptake support

The design 'architecture' of uptake in the programmes reviewed reflect that of KM/KB (the KB functions overlap significantly with uptake activity) (see Table 4 above). As noted elsewhere, while some unique partnerships show that it is possible for external actors to lead uptake activities (e.g. UPGRO), these cases appear specific and we do not recommend this as design approach due to potential trade-offs involved. Programme size also plays a role; the successful cases of external research uptake leadership tended to be in smaller programmes with a narrower scope of action. Given the expected size and scope of CLARE, external actors leading uptake do not seem to fit the model.

At the portfolio and programme levels, having internal uptake leaders allow systems to develop that interconnect functions; this report emphasizes the interconnectedness of these programme

[3] Dedicated teams are already being reflected in newly emerging programs, such as the DFID-funded Asia Regional Resilience to a Changing Climate (ARRCC) program, which includes regional bodies to translate and broker climate information (Corbelli, 2018).

function and recommends options that enable interconnectivity (potentially with exception of evaluation; see Section on MEL). At the program, and potentially project, level, having project-specific leads for national and sub-national uptake combined with programme level support, as in the CARIAA model, appears to be a well-suited model to build upon.

6.4 Fit with future work

Based on insights from the programmes, there are several considerations regarding research uptake functions for the future work of CLARE:

Commissioning has implications throughout the programme
The call can signal expectations and outline broad objectives. Research uptake aims should be clearly conveyed. It is worth noting that uptake / impact can be less of a priority with Research Councils, prioritizing uptake requires mutual understanding of all involved partners involved in the commissioning and selection processes.

Appropriate resourcing is communicated from the commissioning period
Fund Managers have a role not only in communicating the importance of uptake but advocating and enabling uptake throughout the project. Resourcing research uptake includes attention to: staffing from outset, capacity building to address gaps, collaboration and engagement throughout, communication functions, brokering and translation functions, targeted knowledge products (infographics, radio shows) and translation (e.g. Arabic, French, Swahili).

Building research uptake competencies and capacities will be critical in many contexts
Having resources to hire staff or manage activities assumes these capacity are present, but in many countries they are not. Programmes and projects should conduct reflexive exercises that identity strengths and gaps, and build capacity through the unallocated budget lines that anticipate these needs.

Consider experimental modalities that bring together unlikely partnerships
Research suggests that uptake strategies should consider 'insider' and 'outsider' involvement in the systems that they seek to influence (Stewart et al, 2018). Experience in the programmes analyzed suggests that beyond acting in 'insider' and 'outsider' roles, new modalities to partnerships may better facilitate collaboration, such as embedding and secondment approaches, not only as a means to enable evidence-informed decision making but also to strengthen and better situate research approaches, questions, and communication and enable more immediate two-way feedback. This includes engaging the private sector, however this should be done when real opportunities exist as opposed to a requirement that of forced upon projects. Past experience suggests a thoughtful yetcautious approach.

MEL is one form of incentive creation
All individuals and partners operate in spaces and sectors that have their own incentive systems. Programmes and projects should be intentional about creating new incentive structures to encourage research uptake, while recognizing existing ones.

Table 10: Priorities for Research Uptake, by Scale

Scale	Priorities for Research Uptake
Portfolio	There is no distinct pattern to impact, each pathway is context-specific, and being excessively prescriptive with uptake approaches may result in rigidity that prevents emerging pathways for uptake. Rather, systems should be built based on assessments of impact aims, regional contexts, who is involved, and emerging networks and opportunities. Draft and revise impact pathways or theories of change. Commit time on a regular basis to re-visit impact pathways based on progress, learning, new opportunities. Conduct regular horizon scans for new opportunities, particularly on the international scale that may be beyond the vision of programmes and projects. Aim to ensure the building blocks, or foundation, to enable uptake are in place or being put into place with clear and regular assessments and strategies. As per the CARIAA learning, these may include: 1. Sustained, collaborative relationships with stakeholders 2. Pair desired outcomes with flexible and iterative approaches 3. Develop usable MEL with feedback cycles to know what is working 4. Use diverse multimedia communications, with clear messages, audiences and strategies 5. Ensure researchers have the capacity to support research uptake 6. Budget for dedicated and trained staff (Prakash et al, 2019).
Program	Ensure that there is a clear programme-level vision, goals, and impact and uptake strategy. Ensure expectations of programme and projects are aligned with MEL systems, and use these to collectively set and revise priorities, work and legacy plans. Budget should reflect the research uptake objectives. This may include costs such as open access fees, but also resources for translating into different forms (e.g. briefs, articles, blogs, radio) and different languages (e.g. local language publications). Allocate flexible or responsive funding to engage with unplanned or emergent opportunities. In early stages this may focus on capacity building and training, and then shift toward enabling new research, as well as more specific uptake and impact activities. Conduct stakeholder mapping and support with on-going stakeholder engagement throughout the entire programme cycle. Track / document stakeholders engaged throughout for ease of follow-up and outreach at later dates (anticipate turnover as well as additional people, such as post-docs). Be clear about 'who decides'. Be mindful of power imbalances between Northern/Southern partners as well as research and uptake partners in setting uptake

	strategies. Those with the most contextual knowledge may not be those with the most power in the partnership. Conduct regular horizon scans for new opportunities, with a focus on engaging the thematic and regional scales.
Project	As resources allow, build connections with the programme-level staff so that project level change can filter up to inform programme-level learning and engagement. On-going engagement with sub-national and local actors to build trust, broaden networks and identify opportunities to engage in co-production. This can be supported by stakeholder mapping exercises at these scales to identify new partners or potential 'unlikely allies'. Conduct regular horizon scans for new opportunities, with a focus on engaging the national and sub-national actors.

Table 11: Priorities for research uptake, over time

Years 0-2	Years 2-7	Years 7-10
At the portfolio and programme levels, focus on planning for uptake while building the foundation of trust and fostering relationships. Ensure there is clarity about what uptake means and how that will be pursued. Liaise with project partners to foster bottom-up and top-down input. All three scales should develop research uptake strategies and impact pathways or theories of change. Strategies/ToCs should be nested to illustrate the interconnection of activities across scales. These should influence MEL and KM work to ensure both outputs and outcomes are integrated and connected. Begin working across scales to understand and stimulate research demand, which is the start of an on-going process. For	Focus on engagement, co-production, network and trust building (internal and external). Tailor activities toward the scale of action; projects tending toward local-to-national scales, programmes at national-to-regional scale, and portfolio at the international/ intergovernmental scales. Establish mechanisms to support projects in responding to emergent, unplanned activities based on findings or new opportunities. Provide thought leadership and advocacy at portfolio scale on the value of uptake work. Not all researchers will be supportive and not all will have been involved at the outset, but their support is critical. Conduct regular synthesis efforts (e.g. annually) at the	In the final 1-2 years there should be limited new research by projects. Programmes should have a dedicated period for synthesis, communication, promotion and engagement. These may need to be supported by portfolio, particularly for synthesis that is cross-programme. Focus on knowledge brokering, translation, communication, dissemination, engagement, horizon scanning, responding to windows of opportunity. Additional resources can be introduced at the portfolio and programme scales to manage tasks that may be unplanned in research project or cross-programme activities, such as cross-program or -portfolio syntheses or responding to emergent opportunities.

projects, this may mean demand-led research or knowledge coproduction approaches. For programmes, this may mean engaging relevant regional stakeholders. For the portfolio, this may mean providing thought leadership and guidance as new collaborations develop and new research initiatives crafted. Use this period to explore the impacts of past programming, conduct baselines, reviews, or political economy studies (see MEL section).	programme level, and as relevant project level, so that the process builds over time. This also encourages collaboration and adaptive management earlier in the programme cycle. Portfolio level syntheses may be in response to specific opportunities or unique contributions (potentially based on regular horizon scans of program activities as well as engagements at the international and intergovernmental levels).	Ensure portfolio and programme scale MEL and KM systems capture learning and impact, as these activities may be missed in evaluation as the final activities to take place. Consider how the legacy of this investment will be monitored and evaluated, given that impacts will occur beyond the programme cycle.

7. Programme Function: Adaptive Management

7.1 Overview

Research programmes like CLARE have to deal with a range of shifting priorities, including '*changing behaviours, shifting incentives, overcoming power imbalances and catalysing anticipated changes in one part of a social, economic, political or environmental system that can have unforeseen effects elsewhere*' (Wild et al, 2019). Incorporating principles of adaptive management into project and programme design will be a key to CLARE's success.

Adaptive management can be broadly defined as active decisions and adjustments taken by a programme in responding to new information and changes in context (USAID, 2018). A key component of adaptive management is integration with MEL systems to inform responsive programming. As programmes evolve over time, MEL insights can be used to foresee critical junctures, identify options and facilitate a process of collaborative deliberation in choosing new routes forward. This means moving away from MEL as a process primarily focused on the design and end stages of programme, to one that continually feeds into a process of deliberation, reflection and change.

Adaptive management can be fostered in a number of ways. A key first step is instilling a culture of reflection and collaborative deliberation across the program. This includes regular periods of review, allowing for data to be collected and appraised at all stages, and supporting emerging insights and lessons. In addition, insights from the Global Learning on Adaptive Management initiative (GLAM) highlight the need for creating an institutional environment that has the right tools and incentives to support adaptive management (see Table 12).

Table 12: Key consideration in supporting adaptive management

	Key considerations
Capacities	• Do senior leaders and managers foster an enabling working environment and shared mindsets around adaptive change? • Are there safe spaces to recognise uncertainty, identify early failures/what is not working, and to ensure that action is taken to address it? • Are principles of adaptive management clearly positioned as an internal team function? • Is value placed on, and investments made in, staff capacities of curiosity and creativity, critical thinking, openness to risk, comfort with uncertainty? • Does recruitment, reward, training promotion systems enable these attributes and behaviours?
Incentives	• Are reporting and accountability mechanisms aligned with adaptive management

	processes? Do they incentivise learning and adaptations? • Are contracts, financial and human resource arrangements supportive of the need for adaptations through the implementation process?

Source: Ramalingam et al. 2019

These considerations resonate well with the longer-term programming approach envisioned for CLARE. More importantly, allowing for iterative disbursement of the programme's financial resources could mean that CLARE is able to respond to emerging priorities as they emerge. This is particularly important to programming aimed at promoting research uptake, where opportunities for engagement can be difficult or even imposible to identify in advance.

7.2 Approaches and architectures

The principles of adaptive management have been embraced to varying extents across the eight DFID programmes (see Table 13). Smaller programmes, such as AgMIP and CIRCLE, have tended to operate under relatively rigid operating procedures. Here reflective programming has been coordinated through the central management team with inputs and approval from DFID. However, a number of the larger programmes have embedded aspects of adaptive management into their structures. In most cases, responsive programming has been orchestrated in conjunction with the knowledge management unit (such as FCFA's CCKE team, or SHEAR's KM), allowing for lessons learned from the projects to be fed back and acted upon.

Table 13: Summary of adaptive management structures across key DFID programmes

	Adaptive Management
CARIAA	Adaptive management largely led via IDRC, and linked to the programme's KM functions. Small changes in project design and delivery took-place throughout - largely informed by monthly management meetings and a series of reflection and dialogue exercises with projects. Set up an Opportunities and Synergies Fund to take advantage of new priorities that emerged over time - require projects to be incentivised and supported to participate.
SHEAR	Learning and response functions led by the SHEAR Knowledge Broker, with a number of relevant themes identified to support it. A responsive fund (the SHEAR Applied & Innovation Fund) set up to support small pieces of research and activities as they emerge. Knowledge exchange and learning acknowledged as Output targets in the SHEAR logframe
CIRCLE	Learning and adaptive management coordinated through the ACU, together with approval by DFID SRO No explicit mechanism set up to facilitate internal learning, though deliberations take place between the management team and project partners.
AGMIP	Adaptive management led by the AgMIP leadership team, together with consultations with

	DFID SRO Informal process of internal dialogue and reflection, with a heavy role played by annual reviews
WISER	Adaptive management led by the UKMO (and to a lesser extent ACPC). Considerable support provided through the TRANSFORM program, with a number of learning and reflection workshops set-up. Heavy use of the quarterly and annual reviews to support reflection and course-correction.
ESPA	Considerations around adaptive management largely led by the ESPA directorate Large degree of autonomy in project delivery, in keeping with traditional NERC structures
FCFA	Adaptive management facilitated through the CCKE with a number of learning and reflection workshops set-up throughout the course of the program. Pilot and scope phases helped to shape the design and allocation of future funds (though affected by poor timing and overlap between pilots and the main program) An Applied Research and Innovation Fund supports collaboration and responsive research
CCMCC	Learning and reflection largely facilitated by the NWO management team, supported by engagements with DFID SRO (including annual half-day meetings on progress) Considerable weight placed on the mid-term review and evaluation to facilitate course correction and learning

In a small number of cases, the design and targeting of programmes was led by iterative scoping exercises. The case of FCFA highlights this in particular, with a 12-month scoping phase run across a number of countries to identify entry-points for engagement.

Once up and running, reflection exercises have been organised at various stages of the programmes under study, largely through learning workshops and surveys. In the case of WISER, a stand-alone alone project (TRANSFORM) was established to support cross-project learning, with the view of helping the WISER management team gauge programme health and progress. Many of the larger programmes have also set aside funds to support small research or technical advisory services on an *adhoc* basis - most notably SHEAR, FCFA and CARIAA (Table 13).

In all cases, the standard DFID reporting structures were used to support data collection and log requests for changes to objectives, targets and contracts. Most notably, the quarterly and annual reviews (and to a certain extent, the mid-term reviews) serve as opportunities to reflect on the suitability of the Logframe/ToC, and consider whether amendments or additions might be needed in responding to any unforeseen circumstances on the ground.

7.3 What worked and what didn't

Linking adaptive management activities with knowledge management

One of the key advantages a large research programme is the ability to dedicate targeted resources towards learning and iterative functions. Programmes such as CDKN, BRACED, FCFA, SHEAR and CARIAA each had tailored KM units that focused on gathering insights from their various projects. These were used to reflect on levels of progress made to date, and any course-corrections that might be needed. They also shed light on a programme's capacity gaps as well as new opportunities that should be exploited. It is here that regular learning workshops and dialogue events have proven especially invaluable, feeding information back to the Fund Managers/funders and allowing for quick decisions to be taken if changes are needed.

A big part of the need to link KM to adaptive management is fostering an internal environment that supports critical reflection. This point is underscored in learnings from ESPA programme, as the final evaluation notes:

> '*While some ESPA researchers reflected positively on the value of 'town hall' meetings linked to forthcoming ESPA calls – particularly that linked to the ESPA 2012 call – others felt excluded because the right opportunities for networking and joint reflection were not created. Finally, and linked with this, there appears to have been little reflexive theorising at the programme level of the relationship between interdisciplinarity and designing for development, or learning from the rich debates that have developed around this issue over the past decade, particularly in the Global South. As a result, a significant opportunity for adaptive and co-productive learning both within and across projects, and for the programme as a whole, was foregone*.' (Wells et al, 2017)

A key advantage of using KM units to facilitate adaptive management is their relative neutrality. Projects may be more willing to discuss areas of weakness with a trusted KM unit than seeking to negotiate directly with the funders or fund managers. Collaborative learning dialogues also help in this regard, allowing projects to share lessons learned in adapting to new circumstances, or dealing with common challenges. However, it is important to ensure that these units' mandate extends to adaptive management if they are to cover this role, and that they have access to funding should it be needed, to ensure legitimacy.

Taking advantage of responsive funding

By their very nature, key issues and knowledge gaps for climate research are likely to vary over time: often shifting according to global events, which may or may not be predictable (e.g. UN climate negotiations, or devastating hazards like Cyclones Idai and Kenneth in southern Africa). In order to respond to these evolving challenges, many of the programmes under study have taken advantage of active funds, often termed 'innovation' or 'opportunity' funds, depending on the program, which are broadly deemed helpful. The creation of small funds in response to the 2015 Nepal earthquake and El Nino events under SHEAR is a good example (with DFID subsequently replenishing the fund). Responsive funds have also been used to support

collaborative and emerging cross-project activities (such as dedicated funding streams under CARIAA and FCFA) for joint research or policy influence.

Conversely, in some programmes financial management systems presented barriers to teams' ability to manage adaptively. Two issues were highlighted in these cases: First, excessive adherence to pre-defined disbursement schedules that left funds largely committed from the programme's outset, and second, weak financial monitoring capacity to identify where areas of under-spend might be creating new opportunities to invest in other areas.

Box 7: Case Study - Adaptive management in CARIAA

The CARIAA programme presents an interesting contrast to many of the other DFID-funded programmes. Adaptive management, MEL, fund and knowledge management were overseen by IDRC. While this created a technical and coordination challenge for IDRC, it presented important opportunities to foster learning and collaboration within the CARIAA management team. Fast feedback loops, and active use of IDRC's regional offices and representatives meant that collective concerns raised at the project level could be deliberated and acted-upon efficiently (Harvey et al, 2017).

Perhaps the most important factor in supporting adaptive management was active dialogue and engagement within the CARIAA management team. Monthly team meetings provided a forum for sharing information, identifying strategic events, and evolving the programme structure and processes. This included planning of annual learning reviews, oversight of programme-level working groups, and guiding programme evaluations (Currie-Adler et al, 2019). The fact that IDRC performed so many of the core management functions for CARIAA meant that much of this learning was in-house, allowing for details and rapid responses to come out of internal meetings.

Another successful trait of CARIAA was the fact that a considerable portion of the budget was set aside for supporting collaboration, learning and flexible decision making, with 9% of the programme's finances reserved for 'research integration' (Adler et al, 2019). One of the tools used for supporting adaptive management was the Opportunities and Synergies Fund. This was a flexible pot of money, designed in the second year of the program, to support collaborative activities between projects that were not foreseen at the start of the program. Many of the working groups for these funds were self-organised by CARIAA project members, and were encouraged to be proactive in deciding how to share, design and work together. In reflecting on the relevance of this flexible fund, Currie-Alder et al (2019) note that '*the resources provided by this fund allowed the programme to seize emergent opportunities for collaboration that arose spontaneously during the learning reviews and consortia meetings*'.

Ensuring that projects took advantage of this flexible fund was not straightforward, however. The simple availability of funding did not guarantee project engagement as, during the final two years, the limiting factor for many participants was time-pressure rather than funding. As such, there was a general reluctance to take on added levels of responsibility in addition to the already substantial workload. In hindsight, the funded projects benefited from IDRC efforts to convene and facilitate the subgroups that coalesced around these subprojects. IDRC programme staff therefore found themselves working directly with the projects to support them in developing proposals to the fund (Harvey et al, 2017).

In reflecting on these insights for CLARE, a number of interesting factors must be considered. First, there is clear value in having core management functions kept in-house - allowing for fast learning,

feedback and course-correction. However, few institutes have the capacity and know-how to perform all of these functions. Moreover, CARIAA had only 4 large projects. Scaling this up to CLARE's size and scope would be a considerable undertaking, and may not be a realistic objective for one entity. Secondly, active and engaged dialogue between the management functions is crucial to facilitating adaptive management. Lastly, responsive funding can help to take advantage of new opportunities that may not have been present at the start of the program, though provision of resources is not sufficient on its own. Thought should be given to the timing of calls, with support needed in getting projects engaged and incentivised to take part.

Building flexibility into the programme design

Relationships with key stakeholders can change quickly. This is especially relevant when working with a range of actors across civil society, academic and policy. For example, the ASPIRE project under WISER was set up to provide dedicated inputs to the World Bank's Social Protection Programme across a number of African countries. Yet, shifting political priorities within the WB (alongside other institutional tensions) meant that engagements between the project's primary stakeholders (namely UKMO and the WB) were limited. While the situation did improve over time, ASPIRE had to change course quite considerably to ensure that the project maintained relevance and impact. Changes to the DFID SRO and movements of key personnel meant that these issues were not addressed until ASPIRE was well underway - with significant implications for the success of project outcomes. Here, important lessons were learned in ensuring that key players (namely the Fund Manager and funder) need to be actively engaged in helping to address concerns raised by projects, and provide timely and decisive approval if a project needs considerable course-correction.

Complex programmes like these also have to contend with a wide range of unforeseeable outcomes. In another relevant example, one of the CARIAA projects was challenged with responding to concerns of financial irregularities with one of its key research partners. The fact that CARIAA had a number of regional officers that were able to quickly identify the issue, liaise with project partners and provide tailored localised solutions proved key. Indeed, CARIAA's final evaluation report notes how '*having the flexibility to adjust to changing conditions or to respond to unexpected demands was a key feature through which many of the outcomes [under CARIAA] were achieved*' (Baastel, 2018).

Changing focus as the programme evolves

Key to effective adaptive management of a research programme is recognising that different stages of implementation should have different priorities. It is imperative that outputs not be entirely predefined at the outset of the programme - allowing projects time to refine targets and priorities as the projects evolves. The first two years of the programme are especially critical, and require the FM and KM to respond rapidly to the challenges that projects are facing on the ground. The years that follow can allow for consolidation and further refinement of logframe targets and expects outputs - though again, careful facilitation of learning and reflection is needed with the KM. Finally, the closing phase of the programme is where maximum effort is put into ensuring that research findings are taken up and used by relevant decision makers. It's

also where many of the written outputs are likely to materialise, including efforts to synthesise cross-programme collaboration and learning. The wealth of published materials emerging following the end of CARIAA (as well as a number of synthesized outputs from ESPA) are a testament to the benefits of doing this well.

Each of these stages in a programme's life-cycle requires different skills, activities and resources to be set aside. They also mean that programmes need to carefully coordinate which inputs are going to feed in at different times. In the case of FCFA, the CCKE initially struggled to recognise that collaboration and outreach activities would invariably be limited during the first year (as projects are concentrated on getting setup). The CCKE's subsequent shift towards supporting targeted pieces of technical assistance (such as political economy analyses for recipient counties) came a long way in diverting the KM unit's focus towards productive support functions.

7.4 Fit with future work

Building on the experience of past programmes, in order for CLARE to embrace principles of adaptive management and respond to changes in its internal and external environment, a number of steps are required.

Provide tools to track portfolio-level health in near-real-time

The size and scope of CLARE is largely unprecedented in the context of climate and development research. The sheer number of projects and outputs that are likely to sit within the portfolio will no-doubt present the Fund and Knowledge Management teams with unique challenges. In fact, care needs to be taken in translating and scaling up lessons learned from DFID's programmes as these may not necessarily resonate with far larger budgets and more complex institutional arrangements. At the portfolio-level, particular care needs to be taken to ensure that key indicators can be easily tracked and monitored, allowing for management teams to quickly identify trends and seek to address any collective issues that may arise over time.

The example of the interactive dashboard used under CARIAA is one potential solution. Experiences from the CARIAA management team show that this simple tool - a live document maintained based a simple GoogleForm tracking projects' key outputs - allowed them to quickly gauge the health of the programme and report progress to the executive committee and DFID on a near-real-time basis. It is unlikely that a GoogleForm will be able to suit the technical and logistical needs of CLARE in the same way as CARIAA given its size and complexity - indeed considerable technical assistance was required through Euforic Services Ltd. Yet, creating an easy to manage portfolio-level dashboard for CLARE would come a long way in supporting responsive programming and should be resourced and designed accordingly. This would also include setting-up of the system prior to the programme's launch, so that forms and requirements placed on projects can be piloted and managed to ensure that time and administrative burden is kept to a minimum.

Ensure close interaction between programme and portfolio-levels units

In order for CLARE to remain responsive, close coordination and interaction needs to exist between programme and portfolio-level KM/FM functions. Given that few of the prior DFID programmes have been large enough to warrant separate programme and portfolio-level entities, much of this architecture will be new. The closest parallel may come from SHEAR. Here, a number of distinct processes were supported under the programme including: the main NERC-led research calls; a separate function led via GFDRR; as well as a number of responsive research calls set-up through Applied and Innovations Funds. This resulted in a complex mix of initiatives (owing largely to differences in lead entities and starting periods for each) and the programme management team struggled at times to coordinate ongoing functions. With this in mind, care will need to be taken to ensure that each of the programmes that sit under CLARE can communicate and liaise with the portfolio-level management team. This be done through a number of means, including close working relationships and regular check-in periods and secondment of staff between the portfolio and programme-levels.

Make better use of the annual-review process and linkage with MEL

A core component of adaptive management is supporting and facilitating environments conducive to reflection. A currently-underused opportunity is the annual review process with the funder (or FM). Rather than quickly discussing targets and checking progress, these opportunities could be a vehicle for reflection and revision. This would require a more inclusive and proactive approach, ensuring that progress and concerns from all project members are reflected. Promoting project logframes as live documents is important, such that can be periodically opened up and revised should circumstances necessitate small (or potentially large) tweaks to targets, outputs and outcomes. Again, the annual review can serve as a well-suited mechanism to facilitate such a discussion but would require a significant change from the present norms where our experience in evaluations shows that projects often come into the review process unaware of the full range of targets laid out in the logframe (particularly in the first year). In some rare cases, project managers are even surprised at why they had chosen or committed to them at the outset (given unexpected over/under achievements). Yet, key to ensuring the responsive nature of programme targets is rapid feedback from the Fund Manager and funder. While small changes to logframes are often made, approval typically takes months, meaning that projects are stuck in limbo - not sure whether to continue with an ill-suited path or risk diverting to a new one that will eventually be denied approval.

Recognise that priorities for adaptive management will shift over time

Priorities for encouraging adaptive management must themselves evolve over time. This means that CLARE should transition through a number of distinct phases, each requiring different resources and technical support structures which, to a certain extent, should be closely linked to the needs of projects/programmes. In reflection on the principles laid out by the GLAM initiative, we identify periods relating to the early, mid and final years of CLARE (see Table 14 for a summary).

Table 14: Summarised priorities for three distinct phases of CLARE

Years 0-2	Years 2-5	Years 5+
START-UP PHASE Host quarterly check-ins with the MEL manager to gauge progress (light touch). Carry out scoping and political economy assessments Emphasise quarterly and annual reviews and revise logframes/ ToCs in line with evolving assumptions	**CONSOLIDATION PHASE** Revert to annual reviews for check-ins with MEL manager on progress Ensure a heavy emphasis on the mid-term review, encouraging an in-person full team check-in Heavy use of innovation funds	**WRAP-UP AND LEVERAGING PHASE** Fewer opportunities to change project structure Ensure projects and programmes are able to respond to new policy windows of opportunity, through funding resources as well as technical support

Different roles at each scale

Not only do priorities of adaptive management change over time, they differ by scales of operation (Table 15). At the portfolio-level the focus should largely be on providing quick responsive feedback to any requests for course-correction and scanning external conditions that present risks or opportunities (e.g. currency fluctuations, political instability or key global meetings). At programme level the emphasis should be on creating meaningful environments for projects to reflect on progress, as well as providing resources and technical support to fill emerging capacity gaps. Projects should continually evaluate whether their activities are relevant and best suited to their contextual environment on the ground, and apply continual feedback loops as required. This means periodically bringing together project partners to discuss progress, and reflecting on progress to date.

Table 15: Priorities for adaptive management, by scale

Scale	Priorities for adaptive management
Portfolio	Focus on ensuring that programmes are responsive to changing needs and environments Ensure quick turn-around and approval/rejection for change requests
Programme (supported by a dedicated manager)	Focus on supporting environments for meaningful reflection amongst and across the projects. Ensure programme responsiveness to different contexts. Fragile and post-disaster contexts likely to need high levels of flexibility given the potential for rapid change in circumstances Provide technical support in allowing projects to redesign elements, as well access available sources of finance Act as a go-between for projects and portfolio. Arbitrate in cases whether there are considerable tradeoffs and advise on potential next steps

	Commission (or carry out) periodic assessments of knowledge gaps and the state research capacities to help identify emerging areas. Set aside resources to allow for projects to take advantage of new opportunities - prioritise examples where policy windows allow for IP to be maximised; or where multiple project can leverage policy influence through small additional activities
Project	Focus on continually reflecting on the project's ToC and IP, bringing together project partners and check-in with MEL manager to assess whether changes need to be made to accommodate unforeseen circumstances Fast-paced learning, with continual feedback loops. Emphasis particularly in the first few years of the project, moving to consolidation during mid- and end-line phases

Adaptive management looks different in fragile and conflict affected states

Projects operating in countries and regions that are fragile or conflict-affected face a bigger set of risks to progress that can change rapidly. The research arm of BRACED Myanmar Alliance, was forced to radically shift its focus and field site when the Rohingya crisis occurred (Box 8).

Box 8: Case study - BRACED Myanmar Alliance

The importance of adaptive management in fragile and conflict affected areas is underlined by the case of BRACED's Myanmar Alliance, a 5-year project led by Plan International. Together with BRACED's KM unit, a project was set up to track resilience levels over time in BRACED-served communities using mobile phone surveys. The Alliance had originally chosen to implement the project near Sittwe, Rhakine district, yet with one week to go before kick-off, and large logistical and resource-commitments made in advance, local field-staff informed BRACED that local tensions were escalating and advised against project roll-out. Indeed, a week later, the Rohingya crisis got underway, with all international NGOs barred from the area. With project resources pre-commitment, the Alliance had to find a suitable new site at very short notice without jeopardising the objectives and quality of the project. A secondary site was quickly found in Hpa An, towards the east of Myanmar - with far fewer security concerns, allowing the project to continue successful over the following 18 months.

A number of factors were crucial to adapting to the fast changes on the ground. First, consultation with local stakeholders was crucial in gaining advance insights into local tensions. Without access to local networks, the project would have come up against considerable challenges jeopardising project success. This has important implications for CLARE's work in fragile states, as a key component of project selection should hinge on the depth and quality of local networks.

A second success factor is the need for fast feedback-loops. In order for the project to switch site and focus, fast communication and approval was needed between the Alliance and BRACED's management units. Once the issue was flagged with relevant leads, and an alternative proposal developed, final approval was received within 24 hours. While these turn-around times may not be replicable in all contexts, they highlight the value of rapid feedback loops between projects and programmes. In particular, clear guidance on how to process course-correction requests during crises, and who has responsibility for sign-off can be a significant aid.

It is here that adaptive management will be key, meaning that CLARE will have to provide tailored services for projects in conflict zones. This could mean setting up of dedicated protocols for rapid programme and portfolio-level decision-making and arbitration when on-the-ground tensions threaten the delivery (and safety) of projects. Projects should also be pushed to elaborate on contingency plans prior to project commencement, with greater flexibility built into the setting of Logframe targets and ToCs. This would similarly relate to the three timelines in Table 14, with projects operating in conflict-affected areas likely to need longer learning and set-up phases (potentially spanning multiple years).

8. Options and Recommendations

This report has sought to distil lessons from approximately 10 years of DFID-funded research on climate and development, looking specifically at the design and implementation of five programme function areas in eight different programmes. Together, the findings reflect a huge array of experiences across diverse geographical, thematic and interpersonal contexts. This makes drawing firm recommendations a challenge, as a different set of actors operating within the same programme design may yield dramatically different results. With these cautions aside, this final section revisits the key assumptions that have guided our study (and our recommendations) and then outlines a series of recommendations to inform the design of the CLARE portfolio.

Revisiting key assumptions: We first wish to recall the assumptions that have guided both our analysis and the options and recommendations that follow.

1. **CLARE seeks to add new value at the portfolio scale**: The portfolio will provide support and coordination functions alongside fund management.
2. **Coordination and support functions will not be limited to the portfolio scale:** Many of these will exist at both portfolio and programme level and will need to be coordinated.
3. **Investment will be staged**, allowing for adaptive management of the fund and making "membership" in CLARE fluid over its lifespan.
4. **Significant financial investment will be set aside for these functions:** Adequately supporting function areas may require up to 20% of programme budgets.

Based upon our review of the eight programmes and insights from our interviews, we would add a fifth and final assumption to our analysis:

5. **Managing CLARE requires dedicated institutional leadership alongside specialized support:** Given the scale and complexity of CLARE, and lessons learned from the programmes reviewed here, we assume that it should not be a fully decentralized system (i.e. with separate partners overseeing fund management, knowledge management, MEL, etc.), but should instead have a strong lead agency that can play a hands-on role in coordinating these functions. Based upon our experience, our assessment of the programmes, and our past research (Harvey et al, 2019) we feel that IDRC is particularly well placed to play this role in ways that management consultancies, academic institutions or think tanks, or even DFID itself is not.[4] A recent review of IDRC's climate programming found noted that IDRC brings a highly-respected orientation to research and development, alongside the robust, distributed systems and levels of staffing needed to enable effective programming at this scale (Harvey et al, 2019).[5] With this said, we also assume that IDRC does not have the set of specialized

[4] In terms of the expected size of CLARE, IDRC has managed the Think Tank Initiative (2008-2019; CAN$ 200+ million), and CIFSRF (2009-2019; CAN$ 124 million)

[5] We acknowledge that there may be other agencies who boast a similar set of attributes, reputation and competencies (GIZ, for instance, may be one), but would emphasize that there are very few of them.

competencies needed to meet the scale and range of objectives highlighted in the five reviews of function areas above. An IDRC- or similarly-led “secretariat” for CLARE will therefore need to regularly draw upon a network of specialized service providers to support work on knowledge management, evidence synthesis, MEL, and more.

8.1 Design options for CLARE

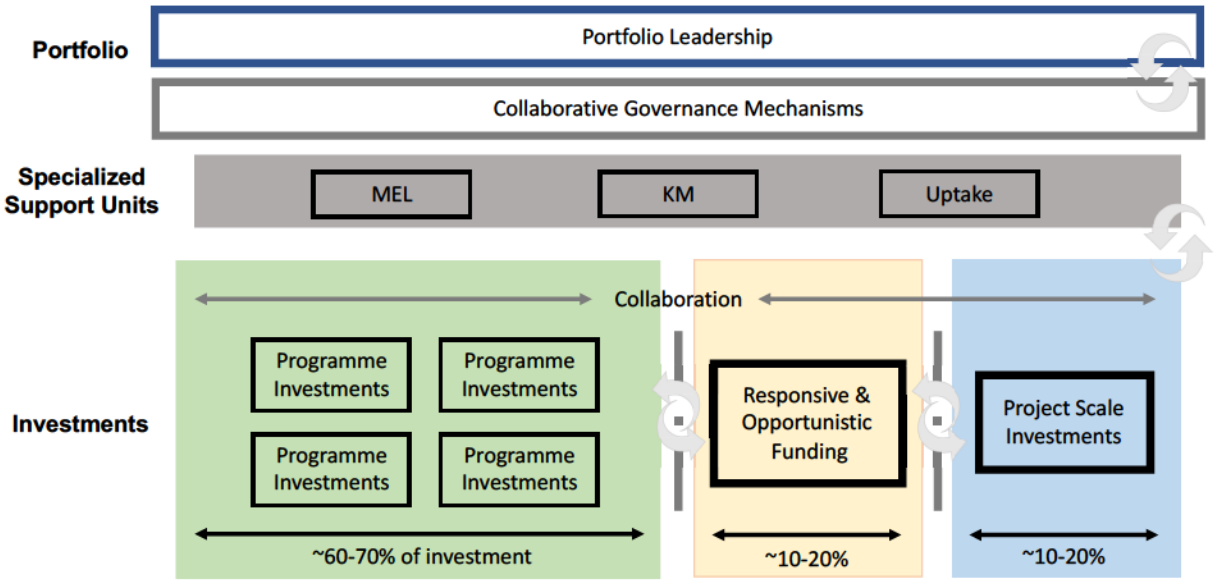
The two design options that follow build upon two conclusions from our analysis on the overall design of CLARE:

1. That a fully decentralized set of function areas (with separate oversight of each area) results in a fragmented structure and reduces value addition.
2. That a fully integrated set of function areas (managed by research programmes and the portfolio lead) will create excessive burden on partners and reduce value addition.

These remaining options focus on overall portfolio oversight, and the function areas at portfolio and programme levels, and their interactions. The programme and project investments (the bottom half of Figures 5 and 6) do not change. In both cases we assume that a majority of CLARE research investments will be disbursed via multi-project programmes selected via competitive calls. In line with the recommendations set out in this report, a second, smaller tranche of investment should be allocated to responsive or opportunistic investments emerging from ongoing work and policy windows. This second tranche may be disbursed to existing funding recipients, building on emerging results from programme-based research, but may also bring new strategic partners on board. A final small tranche is proposed for stand-alone projects that might be more speculative, experimental, or time-bound. These might include, for instance, commissioning horizon scans of emerging issue areas, piloting new methods, or other similar smaller-scale activities. What is critical, based on our investigation, is to ensure there are avenues for interaction and exchange between these different funding streams, and that functional areas do not overlook smaller scales of investment, where significant innovations might be emerging.

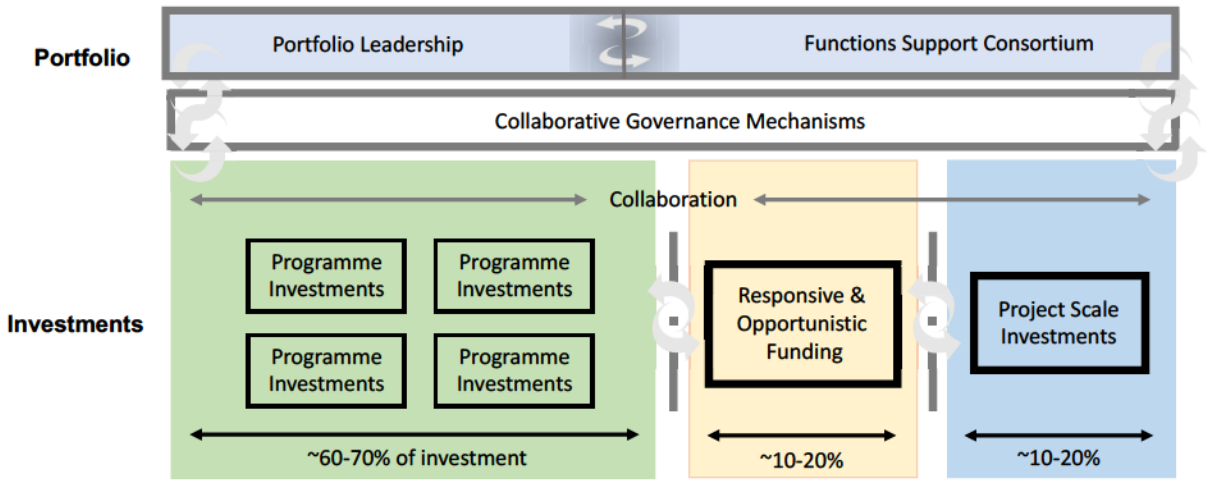
Option 1 (Figure 5) envisions the portfolio and programme leadership being supported by specialized partners that provide dedicated support and brokering for the function areas at the portfolio level (e.g. a dedicated support partner for MEL, another for KM, etc.). These actors would all be members of collaborative governance mechanisms alongside representatives from the portfolio and programme levels. Each unit would engage with funding recipients via the governance mechanisms, and in some cases, directly.

Figure 5: Option 1 - Specialized Support Units



Option 2 (Figure 6) presents a slightly different structure, whereby the specialized support actors from Option 1 form a consortium, as opposed to acting as individual specialized units. This approach acknowledges the interlinked nature of the five function areas. The advantage of Option 1 is that it facilitates the use of a life-cycle approach to portfolio support, bringing some support activities online at specific times of the life-cycle. In so doing, however, the support functions may be less interconnected. Option 2 offers a more cohesive unit, enabling cross-cutting planning and system development as well as building of trust between function areas support partners over the longer-term, but may reduce the ability to phase support parnters in and out. Building on the insights from this review, both options provide a mechanism for cross-scale participation in the governance of the function areas as well as degrees of independence for evaluative functions. Both options also recognize that portfolio leadership cannot also adequately manage all the function areas.

Figure 6: Option 2 - Consortium of Functions Support



8.2 Recommendations

Having presented options around the design of function areas within the CLARE Framework, the following recommendations propose a set of principles we argue should guide CLARE's design and implementation, regardless of the option adopted above. The recommended principles represent, in our view, a distillation of some of the key higher-order lessons emerging from the eight programmes under study.

A portfolio approach to CLARE investment

Climate and development research under CLARE is likely to have a wide range of aims (knowledge building; capacity development; research uptake) and operate in a range of geographies. The scale (both financial and timescale) of CLARE presents an important opportunity to address two of the challenges faced by a number of the programmes reviewed here, namely: the challenge of trying to deliver to multiple, sometimes conflicting, funder priorities simultaneously; and fostering a programme legacy after funding and operations have ceased. We deal with both of these points below in further detail, but the key message here is that seeing CLARE as a portfolio of investments that can feature varying scales, timelines, configurations, and risk-profiles represents an opportunity to be seized. This can allow some investments to accept higher levels of risk and uncertainty (for example, working in conflict affected states, frontier areas of research, or with relatively untested partners) while opting for more secure investments into established partners and themes elsewhere. Taking a portfolio approach implies viewing the full range of investments and partnerships under CLARE somewhat holistically. This includes using portfolio-scale function areas to enhance connections between the various actors, agendas, and evidence within the CLARE portfolio, being particularly mindful that smaller, shorter, or lower profile investments may have a tendency to 'slip through the cracks' or be overlooked, as evidence from UPGRO and SHEAR reveals.

Recognize potential trade-offs embedded in CLARE's ambitions

Building on the previous point, CLARE must recognize the tradeoffs inherent in some of the priorities that it will set, and communicate clear priorities for itself and the programmes it funds. Evidence from CARIAA, FCFA and other high-profile programme investments highlight the tendency of both IDRC and DFID to want to see world-class evidence generation, robust financial oversight and policy impact, alongside the capacity development of Southern researchers and institutions. These expectations can prove unrealistic and may result in Southern partners being relegated to roles of 'junior partners' with limited opportunity to assume leadership roles. As we have noted above, taking a holistic portfolio approach for CLARE may allow these different aims to be met in different segments of the portfolio, but DFID should resist the temptation to impose the full range of ambitions on all of the programmes and projects that CLARE funds. Specific programme-level theories of change would therefore prioritise certain CLARE objectives over others.

More specific to the aim of research excellence that has been prioritized in initiatives like CARIAA and FCFA, CLARE offers an opportunity to move away from traditional notions of excellence dominated by numbers and impact factors of peer reviewed publications. We suggest adopting newer and more relevant models of excellence that encompass a wider range of concerns of the global South including integrity, legitimacy, importance, and positioning for use (Ofir et al, 2016; Lebel and McLean, 2018; Oswald, Gaventa and Leach, 2017).

CLARE should be guided by a portfolio-level Theory of Change

The likelihood of CLARE funding a large and relatively diverse array of research activities suggests there may be challenges in defining how and why programmes and projects should work towards a common purpose. For researchers accustomed to working under research council models of funding, this can represent a significant shift in approach. A portfolio theory of change should set out how the five function areas contribute to CLARE's impact pathways (for example, mobilizing evidence, strengthening capacity or enabling knowledge co-production), and how programmes and projects are expected to contribute to them. It will be an important resource for explaining the "why" of these functions in large and highly-distributed collaborations. This theory of change will necessarily be broad in scope, leaving scope for multiple programme-level theories of change to be "nested" within it without large incongruities (see Harvey et al, 2017).

Adopt a life-cycle approach to portfolio and programme design

Our analysis of each function area has looked at the evolving needs and priorities of research initiatives over their life-cycles. To date, few of the programmes reviewed have taken a life-cycle perspective in their designs from the outset, leading to repeated instances of particular functions coming on too early (working groups), too late (KM/KB), or being overlooked altogether (knowledge synthesis). CLARE presents an opportunity to take a more systematic and developmental approach to the portfolio, orienting investments and support systems according to the stage of portfolio development. With programmes and projects operating on different timelines than the portfolio itself, life-cycles within CLARE will not always neatly overlap, but as

a design principle, this can help orient the activities of function areas, programme management, and other support functions.

Invest in new and established relationships

Strong, trusting relationships at and between all scales of CLARE will be critical to its cumulative impact being greater than the sum of its parts (Cundill et al, 2019b). Among the trade-offs in investment choices mentioned above is a choice between supporting pre-existing research partnership that can start quickly and work together with confidence (e.g. the ESPA-Deltas consortium which later became the DECCMA consortium in CARIAA) versus engaging with new contexts (e.g. fragile and conflict affected states) and growing and strengthening the community of climate researchers in the South by promoting new partnerships. CLARE offers scope to pursue both aims, but funders should recognize the implications of each option. Connecting to the life-cycle approach noted above, new relationships will need time and resources to establish themselves, including investment into capacity support for new community members and opportunities for face-to-face engagement within teams. Planned processes for "onboarding" new partners to CLARE will be important to ensuring they are brought smoothly into existing relationships and systems. Another important opportunity for relationship- and trust-building will be cross-scale engagement through the creation of accessible cross-programme or portfolio-scale working groups that have evolving membership.

Distributed leadership and governance of function areas is needed

This report has emphasized how collective engagement and governance of function areas like KM/KB, MEL and and adaptive management are essential for their effectiveness. Knowledge management, for instance, cannot be done solely *on behalf of* partners in a large distributed initiative. Lessons from some of the programmes reviewed have shown that distributed membership in the leadership and governance of these functions has been an effective means of sustaining engagement (Currie-Alder et al, 2019). This principle holds true for portfolio-level leadership and governance as well, where membership drawing from project and programme teams, as well as representatives from DFID and other funding partners, will facilitate knowledge exchange and innovation across scales. While this principle does not preclude the need for carefully-selected positional leaders, which were noted as being key determinants of programme success. Importantly, attention must be paid to issues of equity and representation within this leadership, ensuring that Southern partners, women, and early career researchers, and are encouraged and supported to play roles in governing these specialized functions.

Invest in organizational capacities in function areas at start-up phase

Failure to address human, technical, and organizational capacity constraints at early stages has a tendency to 'lock' particular partners out of collective systems and processes for the long term. Despite this fact, capacity assessments (or self-assessments) were rarely used at the outset of partnerships in the programmes under review. CLARE should address this gap, allocating funds for helping organizations meet the minimum standards needed in terms of in-house human resource capacities; IT services and connectivity; access to paywalled resources; leadership; monitoring and financial reporting, etc. Lessons from recent programming under GCRF's GROW programme have shown how mandating investments in the development of

organizational capacity from the outset has been effective in addressing critical gaps. Particular attention must be paid in fragile and conflict-affected settings where persistent uncertainty requires that contexts be assessed and appropriate capacity support added to mitigate the challenges posed by anticipatable but unplanned challenges.

Establish cross-scale systems to strengthen coordination

Building upon the value of cross-scale coordination, CLARE should ensure that a certain number of 'soft' and 'hard' systems are developed to work from portfolio to project scale. Obvious candidate systems to use as a starting point include a linked knowledge management system; common reporting templates; and a shared set of meetings, events or opportunities (such as innovation funds) that can incentivise and enable collaboration across the portfolio. As suggested in Section 4.4, it is preferable to begin with a limited set of systems to serve as a launching pad for coordination, leaving space for a more collaborative expansion and refinement of these systems. This will strengthen ownership and engagement. Linking social and technical systems (for instance, by using knowledge management systems within group events and communication) can reinforce the value of these respective systems.

Develop a legacy strategy from inception

The scale of investment that CLARE represents means it should generate significant value in terms of research outputs, pilot initiatives, capacities, data, services and more. Several programmes studied in this review reported concerns about how to ensure that these legacies did not disappear at the close of programmes, whether this is through websites going offline or hard infrastructure investments like monitoring stations being abandoned. An advantage of CLARE's portfolio design is that it can serve as a legacy vehicle for shorter-term or early-stage projects and programmes, provided systems are in place to enable it. Systems may range from an open-access database for data and research outputs (particularly outputs other than peer-reviewed journals which are often poorly indexed online) to 'alumni relations' to ensure that outgoing researchers and collaborators remain connected to CLARE's activities and progress. Strategies for the handover of pilots sites, infrastructure investments, and service delivery to national partners who are able to support their maintenance should feature as a proposal requirement for initiatives with this focus. Finally, we have found examples from programmes, like WISER, where the legacy of research initiatives themselves is anticipated through a logframe requirement to pursue follow-on funding for key activities as part of programme activities.

Implications for commissioning

Commissioning was not included within the objectives of this study. However, in many sections we have found that commissioning plays a critical role in shaping what options, opportunities and shapes the programmes and projects take. The recommendations of this report have considerable implications for commission and its processes within CLARE. This includes having clear requirements and expectations, which have been outlined in the function areas (these may influence the terms of reference that are later developed for actors to lead these functions).

Works Cited

Aidenvironment. No date. Conflict and Cooperation in the Management of Climate Change (CCMCC) Programme - Final Review. Aidenvironment: Amsterdam.

Allen, M., Babiker, M., Chen, Y., et al. 2018. Summary for policymakers. In: ***Global warming of 1.5ºc: An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*** Available online at: http://ipcc.ch/report/sr15/.

Asayama, S., Sugiyama, M., Ishii, A. and Kosugi, T. 2019. Beyond solutionist science for the Anthropocene: To navigate the contentious atmosphere of solar geoengineering. *The Anthropocene Review*, 2053019619843678.

Bayley, J. E., Phipps, D., Batac, M. and Stevens, E. 2018. Development of a Framework for Knowledge Mobilisation and Impact Competencies. Evidence & Policy 14(4): 725-738.

Bornbaum, C. C., Kornas, K., Peirson, L., and Rosella, L. C. 2015. Exploring the function and effectiveness of knowledge brokers as facilitators of knowledge translation in health-related settings: a systematic review and thematic analysis. *Implementation Science 10*(1): 162.

Bours, D., McGinn, C. and Pringle, P. 2014. Monitoring & Evaluation for Climate Change Adaptation and Resilience: A Synthesis of Tools, Frameworks and Approaches. SEA Change Community of Practice, and UK Climate Impacts Program.

Buffardi, A., & Hearn, S. (2015). Multi-project programmes: functions, forms and implications for evaluation and learning. *A methods lab publication. Overseas Development Institute, London*.

Buffardi, A. L., Harvey, B., & Pasanen, T. (2019). "Learning partners": overcoming the collective action dilemma of inter-organisational knowledge generation and sharing?. *Development in Practice*, *29*(6), 708-722.

Camacho, B. 2017. Light Touch Longitudinal Study of UPGro Catalyst Researchers. UpGro Knowledge Broker.

CARIAA. 2013. Call for Concept Notes: Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA). International Development Research Centre: Ottawa.

CARIAA. 2017a. The CARIAA Research-into-Use (RiU) Learning Guide. Guidance Note. International Development Research Centre: Ottawa.

CARIAA. 2017b. Research into Use in CARIAA. Guidance Note. International Development Research Centre: Ottawa.

CARIAA. 2018. Research for Impact. Novel Insights Brief. International Development Research Centre: Ottawa.

Cochrane, L. and Cundill, G. 2018. Enabling Collaborative Synthesis in Multi-Partner Programmes. Development in Practice 28(7): 922-931. DOI: 10.1080/09614524.2018.1480706

Cochrane, L., Cundill, G., Ludi, E., New, M., Nicholls, R. J., Wester, P., Cantin, B. et al. 2017. A Reflection on Collaborative Adaptation Research in Africa and Asia. Regional Environmental Change 17(5): 1553–1561.

Cochrane, L., Lewis, S., Mastaweshaw M., Thornton, A. and Welbourne, D. In Press. Using Farmer-Based Metrics to Analyze the Amount, Seasonality, Variability and Spatial Patterns of Rainfall Amidst Climate Change in Southern Ethiopia. Journal of Arid Environments.

Conway, D., Nicholls, R. J., Brown, S., Tebboth, M. G. L., Adger, W. N., Ahmad, B., Biemans, H., Crick, F., Lutz, A. F., De Campos, R. S., Said, M., Singh, C., Zaroug, M. A. H., Ludi, E., New, M. and Wester, P. 2019. The Need for Bottom-Up Assessments of Climate Risk and Adaptation in Climate-Sensitive Region. Nature Climate Change doi: 10.1038/s41558-019-0502-0

Corbelli, D. 2018. Asia Regional Resilience to a Changing Climate (ARRCC) Programme & the Met Office Partnership (MOP). Presentation 27th September.

Cummings, J. N. and Haas, M. R. 2012. So Many Teams, So Little Time: Time Allocation Matters in Geographically Dispersed Teams. Journal of Organisational Behavior 33(3): 316–341.

Cummings, J. N., Kiesler, S., Zadeh, R. and Balakrishnan, A. 2013. Group Heterogeneity Increases the Risks of Large Group Size: A Longitudinal Study of Productivity in Research Groups. Psychological Science 24(6): 880–890.

Cundill, G., Currie-Alder, B. and Leone, M. 2019a. The Future is Collaborative. Nature Climate Change, https://doi.org/10.1038/s41558-019-0447-3
Cundill, G., Harvey, B., Tebboth, M., Cochrane, L., Currie-Alder, B., Vincent, K., Lawn, J., Nicholls, R. J., Scodanibbio, L., Prakash, A., New, M., Wester, P., Leone, M., Morchain, D., Ludi, E., DeMaria-Kinney, J., Khan, A. and Landry, M. E. 2019b. Large-Scale Transdisciplinary Collaboration for Adaptation Research: Challenges and Insights. Global Challenges 3(4): 1700132
Currie-Alder, B., Cundill Kemp, G., Scodanibbio, L. Vincent, K., Prakash, A. and Nathe, N. 2019. Building Climate Resilience in Africa and Asia: Lessons on Organisation, Management and Collaboration in Research Consortia. CARIAA Working Paper #24. International Development Research Centre: Ottawa.
DECCMA. 2018. Reflections on Our Experiences as Part of the DECCMA Project Team. https://youtu.be/EU5VdlvMaGM
DFID. 2012. Business Case and Summary: Global Climate Change Adaptation and Resilience Research Program. http://iati.dfid.gov.uk/iati_documents/3717206.odt (accessed 1 Feb 2019)
DFID. 2016. A Guide for DFID-Funded Research Programs. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/514977/Research_uptake_guidance.pdf
Duflo, E. 2017. Richard T. Ely Lecture - The Economist as Plumber. American Economic Review 107(5): 1-26.
Erasmus, Y., Maluwa, L. G., Jordaan, S., Lotter, D., Mitchell, J., Motha, P. and the Africa Centre for Evidence. 2018. Building Capacity for Evidence-Informed Decision Making: An Example from South Africa. Evidence & Policy 14(2): 241-258.
Freeth, R., and Caniglia, G. 2019. Learning to Collaborate while Collaborating: Advancing Interdisciplinary Sustainability Research. *Sustainability Science* 1-15.
Gonsalves, A. 2014. Lessons Learned on Consortium-Based Research in Climate Change and Development. CARIAA working paper No. 1. http://hdl.handle.net/10625/52501 (accessed 16 Mar 2019)
Greene, S.M., Hart, G. and Wagner, E.H. 2005. Measuring and Improving Performance in Multicenter Research Consortia. JNCI Monographs, 35: 26–32.
Hammill, A., Harvey, B. and Echeverria, D. 2013. Understanding Needs, Meeting Demands: User-Oriented Analysis of Online Knowledge Broker Platforms for Climate Change and Development. IISD: Winnipeg.
Harvey, B., Cochrane, L. and Van Epp, M. 2019. Charting Knowledge Co-Production Pathways in Climate and Development. Environmental Policy and Governance 29(2): 107-117.
Harvey, B., Cochrane, L., Czunyi, S. and Haung, S. Y. 2019. Learning, Landscape and Opportunities for IDRC Climate Programming. Report for IDRC.
Harvey, B., Lewin, T. and Fisher, C. 2012. Introduction: Is Development Research Communication Coming of Age? *IDS Bulletin 43*(5): 1-8.
Harvey, B., Pasanen, T., Pollard, A. and Raybould, J. 2017. Fostering Learning in Large Programs and Portfolios: Emerging Lessons from Climate Change and Sustainable Development. Sustainability 9: 315. https://doi.org/10.3390/su9020315
Hovland, I. 2003. *Knowledge Management and Organisational Learning: An International Development Perspective: An Annotated Bibliography*. London: Overseas Development Institute.
Jones, L., Harvey, B., Cochrane, L., Cantin, B., Conway, D., Cornforth, R. J., De Souza, K. and Kirbyshire, A. 2018. Designing the Next Generation of Climate Adaptation Research for Development. Regional Environmental Change 18(1): 297–304. doi: 10.1007/s10113-017-1254-x
Lafontaine, A., Volonte, C., Pionetti, C., Moreno, C. and Gonzales, M. 2018. Collaborative Adaptation Research Initiative in Africa and Asia: Summative Evaluation. Baastel: Gatineau.
Larsson, R., Bengtsson, L., Henriksson, K. and Sparks, J. 1998. The Interorganizational Learning Dilemma: Collective Knowledge Development in Strategic Alliances. Organization Science 9(3): 285-305.
Lebel, J. and McLean, R. 2018. A Better Measure of Research from the Global South. Nature 559: 23-26.
Lee, S. and Bozeman, B. 2005. The Impact of Research Collaboration on Scientific Productivity. Social Studies of Science 35(5): 673–702. https://doi.org/10.1177/0306312705052359
Lonsdale, K. and Goldthorpe, M. 2012. Collaborative Research for a Changing Climate. Adaptation and Resilience in a Changing Climate Coordination Network: Oxford.

Machen, R. 2019. Critical Research Impact: On Making Space for Alternatives. Area 10.1111/area.12574
Michaels, S. 2009. Matching Knowledge Brokering Strategies to Environmental Policy Problems and Settings. *Environmental Science & Policy 12*(7): 994-1011.
Mundy, J. 2018. 22 Lessons on Collaboration: Record of Discussion from End-of-Project Partnership Reflection. Internal to HI-AWARE document (on file with IDRC as IC361643402171-208385).
NWO. 2017. CCMCC: Conflict and Cooperation in the Management of Climate Change. Netherlands Organisation for Scientific Research: The Hague.
Ofir, Z., Schwandt, T., Duggan, C. and McLean, R. 2016. Research Quality Plus (RQ+): A Holistic Approach to Evaluating Research. International Development Research Centre: Ottawa.
Oliver, K. and Boaz, A. 2019. Transforming Evidence for Policy and Practice: Creating Space for New Conversations. *Palgrave Communications 5*(1): 1.
Oswald, K., Gaventa, J. and Leach, M. 2017. Introduction: Interrogating Engaged Excellence in Research. *IDS Bulletin 47*(6).
Pasanen, T. and Shaxson, L. 2016. How to Design a Monitoring and Evaluation Framework for a Policy Research Project. Overseas Development Institute: London.
Pittman, J., Tiessen, H. and Montana, E. 2016. The Evolution of Interdisciplinarity Over 20 Years of Global Change Research by the IAI. Current Opinion in Environmental Sustainability 19: 87–93.
Prakash, A., Cundill, G., Scodanibbio, L., Vincent, K., Nathe, N., Morchain, D., DeMaria-Kinney, J., Soumelong Ehode, L., Sukla, D., Mishra, A. and Piryani, A. 2019. Climate Change Adaptation Research for Impact. CARIAA Working Paper No. 22. International Development Research Centre: Ottawa.
Ramalingam, B. et al. 2019. Making Adaptive Rigour Work Principles and Practices for Strengthening Monitoring, Evaluation and Learning for Adaptive Management. Overseas Development Institute: London.
Reid, W. V., Chen, D., Goldfarb, L., Hackmann, H., Lee, Y. T., Mokhele, K., Ostrom, E., Raivio, K., Rockström, J., Schellnhuber, H.J. and Whyte, A. 2010. Earth system science for global sustainability: grand challenges. *Science 330*(6006): 916-917.
Research into Results for the ESPA Directorate. 2018. Ecosystem Services for Poverty Alleviation Programme Highlights 2009-2018. 44p.
Rethinking Research Collaborative. 2018. Promoting Fair and Equitable Research Partnerships to Respond to Global Challenges. Recommendations to the UKRI. September 2018. https://www.ukri.org/files/international/fair-and-equitable-partnerships-final-report-to-ukri-sept-2018-pdf/
Robinson, L., Ritchie, E. and Kenny, C. 2019. UK Research Aid: Tied, Opaque, and Off-Topic? Center for Global Development: Washington.
Rogger, D. and Somani, R. 2018. Hierarchy and Information. Policy Research Working Paper 8644. World Bank: Washington.
Rosenzweig, C, Jones, J. W., Hatfield, J. L., Ruane, A. C., Boote, K. J., Thornburn, P., Antle, J. M., Nelson, G. C., Porter, C., Janssen, S., Asseng, S., Basso, B., Ewert, F., Wallach, D., Baigorria, G. and Winter, J. M. 2013. The Agricultural Model Intercomparison and Improvement Project (AgMIP): Protocols and Pilot Studies. Papers in Natural Resources. 445. https://digitalcommons.unl.edu/natrespapers/445
Schneider, F., Buser, T., Keller, R., Tribaldos, T. and Rist, S. 2019. Research Funding Programs Aiming for Societal Transformations: Ten Key Stages. Science and Public Policy 46(3): 463-478.
Scodanibbio, L. 2017. What we Learned from Working Collaboratively on the ASSAR Project. University of Cape Town: Cape Town. http://www.assar.uct.ac.za/sites/default/files/image_tool/images/138/Website/themepage/What%20we%20have%20learned%20from%20working%20collaboratively%20on%20ASSAR.pdf
Shaxson, L., Bielak, A., Ahmed, I., Brien, D., Conant, B., Fisher, C., Gwyn, E., Klerkx, L., Middleton, A., Morton, S., Pant, L. and Phipps, D. 2012. Expanding our Understanding of K* (KT, KE, KTT, KMb, KB, KM, etc.) *United Nations University - Institute for Water, Environment and Health*. 1-88.
Stewart, R., Langer, L., Wildeman, R., Erasmus, Y., Maluwa, L. G., Jordaan, S., ... and Motha, P. 2018. Building capacity for evidence-informed decision making: an example from South Africa. *Evidence & Policy: A Journal of Research, Debate and Practice 14*(2): 241-258.
Sultana, P. and Thompson, P. 2018. Adaptation, Conflict and Community Based Adaptive Learning. Adaptation Futures Conference, Cape Town, 2018.

Tsai, W. 2002. Social Structure of “Coopetition” within a Multiunit Organization: Coordination, Competition, and Intraorganizational Knowledge Sharing. *Organization Science 13*(2): 179-190.
UKCDS. 2017. Striking the Balance: Between Competition, Collaboration & Impact in International Development Research. Funding Calls & Programs.
UNDP. 2002. Handbook on Monitoring and Evaluating for Results. United Nations Development Program. Evaluation Office: New York, USA.
USAID. 2018. Discussion Note: Adaptive Management. United States Agency for International Development (USAID): Washington, DC, USA.
Vincent, K., Steynor, A., Waagsaether, K. and Cull, T. 2018. Communities of Practice. One Size does not fit all Climate Services 11: 72-77.
Wagner, C. 2018. The Collaborative Era in Science: Governing the Network. Palgrave Macmillan: London.
Wagner, E. H., Greene, S. M., Hart, G., Field, T. S., Fletcher, S., Geiger, A. M. and Vogt, T. M., 2005. Building a research consortium of large health systems: the Cancer Research Network. JNCI Monographs 35: 3–11.
Wells, M., Colvin, J., Moore, A. and Pascual, U. 2018. Ecosystem Services for Poverty Alleviation (ESPA) Program-Independent End of Programme Review. Final report. 196p.
WHO. 2019. Monitoring and Evaluation. World Health Organisation. Accessible at: https://www.who.int/hiv/topics/vct/sw_toolkit/monitoring_and_evaluation/en/
Wild, L. and Ramalingam, B. 2018. Building a Global Learning Alliance on Adaptive Management. Overseas Development Institute: London.
World Bank. 2019. World Bank Group Strategy for Fragility, Conflict and Violence 2020-2025 - Concept Note. World Bank: Washington.
Wreford, A., Peace, S., Reed, M., Bandola-Gill, J., Low, R. and Cross, A. 2019. Evidence-Informed Climate Policy: Mobilsing Strategic Research and Pooling Expertise for Rapid Evidence Generation. Climate Change 10.1007/s10584-019-02483-w

Annex 1: Programme Profiles: Key facts

	CARIAA	FCFA	ESPA	SHEAR	CIRCLE	CCMCC	AgMIP	WISER
Date of inception	2014-2019	April 7th 2014 - June 2021 (extended)	November 30th 2009-March 3rd 2018	December 10th 2014 - September 30th 2020	June 1st 2013 - May 31st 2018	June 3rd 2012 - September 30th 2018	March 14th 2011-March 31st 2017	August 2015 - March 2020 (project extended)
Value	£25M	£16m DFID +£4m NERC → £ 3,418,691 extension	£30m DFID, £10.2m NERC, £3.7m ESRC	£17.87m DFID + £6m NERC	£4.97m	£4.5M	Original programme value: £6.4m Extension: £3.2m Total spend: £9.6m	Full programme value: £35m
Fund Managers	IDRC	Five consortia contracted via NERC. The CCKE unit is contracted by DFID through CDKN.	NERC	NERC	Association of Commonwealth Universities contracted through DFID to manage project	Netherlands Organisation for Scientific Research	United States Department of Agriculture Agricultural Research Service (USDA-ARS)	UK Met Office (East Africa component), The Africa Climate Policy Centre (ACPC) (Policy & Enabling Environment component)
Knowledge Managers	IDRC	Coordination, Capacity Building and Knowledge Exchange Unit (CCKE) hosted at SouthSouthNorth	ESPA Directorate	Practical Action Consulting and Red Cross Climate Centre				WISER fund managers- UK Met Office, and ACPC
Projects (and project leads)	PRISE (ODI) ASSAR (UCT) DECCMA (U. Southampton) HI-AWARE (ICIMOD)	The programme has six components: Four regional consortia: West Africa - AMMA 2050; Central and South-East Africa - UMFULA; Southern Africa - FRACTAL; East Africa - HyCRISTAL	135 projects funded: https://www.espa.ac.uk/projects	4 major projects; then additional rounds of catalyst grants	Circle Visiting Fellowship (CVFs): 40 post-Masters and 60 post-Doctoral CVFs - ACU partnered with The African Academy of Sciences (AAS), who managed the fellows Institutional	7 projects: • TICCI (Utrecht U.) • HYDROPOWER (Coventry U. and Wageningen U.) • MOSAIC (International Institute of Social Studies) • Investing in Land	Two main components. Component 1: Regional research teams focused on improving capacity and reliability of crop-based models. Component 2: Developing outputs	6 completed projects Ongoing projects: • ASPIR • HIGHWAY • AMDAR • TRANSFORM • Weather Wise • Support to ICPAC • Strengthening Weather and Climate Information Services

		An Africa-wide consortium: IMPALA A Coordination, Capacity Development and Knowledge Exchange (CCKE) Unit			strengthening programme (ISP) - Managed by the Association of Commonwealth Universities (ACU) in partnership with Vitae.	and Water (IHE Delft) • Peri-Urban Water Security in South Asia (Wageningen U.) • CALCNR (Middlesex U.) • CoCooR (U. of Barcelona)	based on research from modelling teams. Included 7 competitively selected Regional Integrated Assessment (RIA) Teams.	• Kenya Coastal Resilience and Improving Services for Potato production (CRISPP) • DARAJA • Iteganyagihe Ryacu • Tanzania National Project
Central focus	Understanding vulnerability in key hotspots	Research to enhance scientific understanding and the prediction of extreme weather and climate in sub-Saharan Africa.	Deliver high-quality research to improve understanding of ecosystem functions and services, and their relationship with the political economy, poverty alleviation and sustainable growth.	Supports improved disaster resilience and humanitarian response by advancing the monitoring, assessment and prediction of natural hazards across Sub-Saharan Africa and South Asia	Strengthen the capacity of African scientists to undertake and use research on climate change and its local impacts on development.	Strengthen the evidence on how climate change and climate change policies are affecting conflict or cooperation in developing countries.	Assess the state of global and regional agriculture, with a focus to understand the impacts of climate variability and climate change.	Improve the quality, accessibility and use of weather and climate information services in Africa
Status	Closed	Ongoing	Closed	Ongoing	Closed	Closed	Closed	Ongoing (extended to March 2020)
Overview of the commissioning process	Two stage design. 11 shortlisted bids were funded to develop a full proposal, with 4 finalists chosen.	Competitive call process	ESPA, through a Secretariat within NERC, released a series of competitive calls for research proposals. Calls varied in content, and projects selected.	Competitive call process		International competitive call for proposals. Best research proposals and best tailored research consortia selected.	Competitive application for Regional Integrated Assessment Teams.	Competitive call process

Annex 2: Interview Protocol

Interviewee: **Date:**

PLEASE RECORD!

Preamble: DFID's Climate, Energy and Water team within the Research and Evidence Division commissioned a set of eight research programmes (CARIAA, FCFA, ESPA, CIRCLE, SHEAR, CCMCC, AgMIP, and WISER) in recent years. Each programme adopted its own approach to organizing the functions of monitoring-evaluation-learning, knowledge management, research uptake, facilitating collaboration, and overall management to respond to unexpected or emergent opportunities. As these programmes have reached maturity, it is an opportune time to reflect on their experience, identifying what worked well, in order to inform the design of the next generation of climate and resilience research-for-development.

IDRC and DFID aspire to establish a framework that would enable greater interaction than the above set of programmes. The future framework is expected to guide programming to be responsive to demands for research and evidence, achieve research uptake and impact, and enable to synthesis and learning that addresses knowledge gaps among decision makers and contributes to advancing global science & practice.

We have been tasked with identifying effective approaches to five 'function areas' of such research programmes, looking at lessons from the previous generation of programmes, as well as wider lessons from research and development contexts. Our aim is to propose design options that can work at different scales of interaction (portfolio; program' project) to enhance the effectiveness and impact of future climate research. We are keen to hear your experiences from practice, as well as more 'blue skies' thinking about how to achieve this.

A. Design of the program:

1. Describe the steps of programme design. This includes problem framing, setting aims to address, scale/scope, criteria for success, etc.
    a. Who was involved?
    b. What were the key considerations? (partnership; particular Department objectives; etc.)
2. What requirements were made about project-level design? What support or guidance was offered for this?
3. In your view, did programme design have a significant influence on its operation/outcomes? How?

B. Specific function areas [Alex, Corinne, Rosalind, etc.]:

Broad reflections in cases where the interviewee is working on multiple programmes. Identify outliers (positive and negative)

- Monitoring, Evaluation and Learning:How can programmes track, assess, and learn from their performance at different scales in ways that can inform current and future practice?

- Knowledge Management: How can programmes ensure that data and evidence emerging from research is documented and accessible within timeframes that allow it to be integrated into programme activities?
- Research Uptake: How do programmes scale research results beyond study sites and pilots to impact policy and practice in different places and at different scales?
- Research Collaboration: How do programmes encourage and support collaboration across institutions?
- Adaptive Management: How do programmes respond to unexpected or emergent opportunities (conversely, understanding missed opportunities)?

1. How was the design and governance agreed?
2. What worked well?/what didn't? (what resulted?)
3. What unforeseen things popped up?
4. Where have you seen this area working particularly well/poorly? Why? [this can include programmes outside of the portfolio under study, even outside of Climate & Development]

C. Overall:

1.What would be the optimal design (utopian view)?

2. Are there approaches DFID/NWO/IDRC has yet to try in setting up these programmes that you think it should try?

3. What barriers have prevented adoption of more out-of-the box approaches?

4. Are there areas where DFID/NWO/IDRC have been particularly effective to date? Where else should we be looking for innovative ideas?

Annex 3: Interviewees

Individual	Affiliation	Regarding
Sarah Brown	Practical Action	SHEAR
Georgina Cundill-Kemp	IDRC	CARIAA
Ken DeSouza	DFID	DFID
Sean Furey	Skat Foundation	UPGRO
Jon Harle	INASP	INASP
Corinne LaMain	NWO	CCMCC
Marie-Eve Landry	IDRC	CARIAA
Jon Lawn	University of Southampton	ESPA, CARIAA, GCRF
Kirsty Lewis	UKMO	FCFA, WISER
Alessandro Moscuzzo	DFID	AgMIP, ESPA
Rebecca Murray	LTS International	ESPA
Kate Schreckenberg	King's College London	ESPA
Howard Standen	DFID	CIRCLE
Tim Sumner	DFID	SHEAR
Nicola Ward	Red Cross Climate Centre	SHEAR
Rosalind West	DFID	FCFA, WISER
Emily Wilkinson	ODI	BRACED
John Young	INASP	INASP